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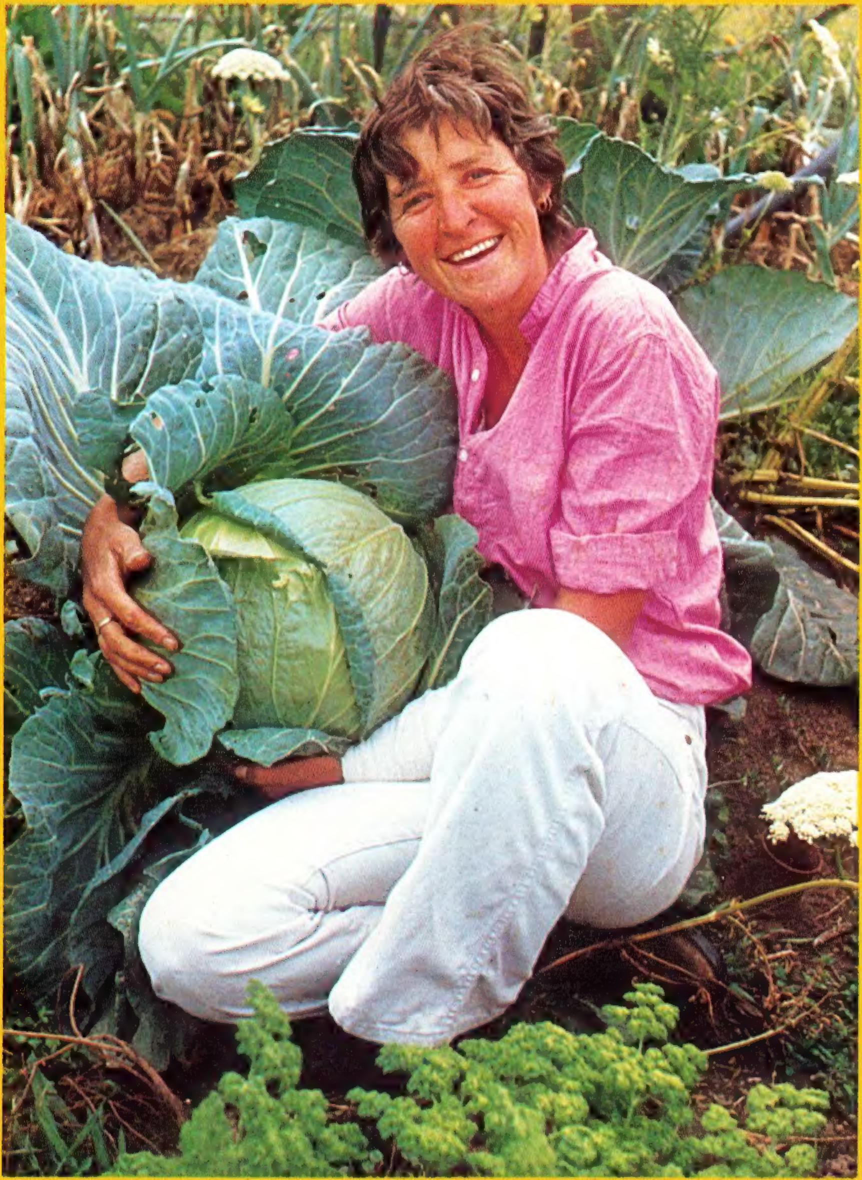
Number 68 — August/September 1989 $3.25

-SELF SUFFICIENCY AND PLANET CARE-

EARTH GARDEN

—FOR BUSH OR CITY ALTERNATIVES—



•Growing paw paws organically •Buying the right wood heater •Frost free gardens
•Make your own hair care products •Meters and multimeters for solar power systems
•Bob Rich writes on laying slate floors •The Neem Tree •Mulled wines for cold nights
•Self sufficiency in the Depression •Good access for that steep block of land
•Earth People Write •LAND LINES and much much more . . .

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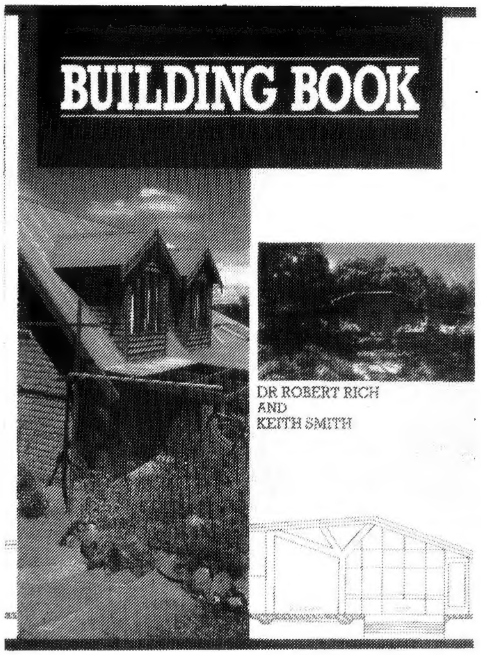
EARTH GARDEN BOOKS

Order form on page 56



EARTH GARDEN BUILDING BOOK

Design and build your own house

Dr Robert Rich and Keith Smith

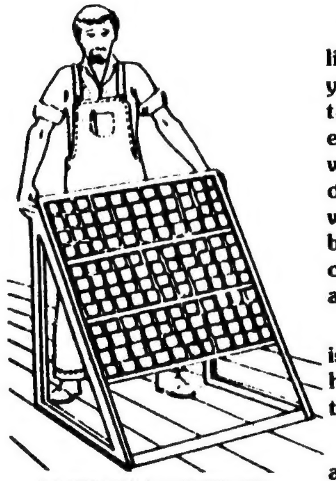
Nelson, 1987, 315 pages, illustrated, large format paperback.

This is the book many people have been waiting for since they first dreamt of building their own home from natural materials in harmony with their surroundings. It answers all the questions for Australian owner-builders. It's a 'practical book for dreamers' and it faces the difficult subjects square on. What the authors have done is show how anyone of average intelligence and reasonable health can build their own home, and probably not end up with a 25 year mortgage at the end of it all.

"This book is intended to provide an antidote to the stereotyped Australian suburban sprawl of red brick houses with red tile roofs, set squarely in a rectangle of ground," said authors Bob Rich, and former Earth Garden publisher and editor, Keith Smith.

AT LAST! EG BINDERS TO PROTECT YOUR COLLECTION

These sturdy magazine binders have recently been produced to protect your collection of back issues. Each binder snugly holds 12 copies of Earth Garden, and prevents tears, dog ears and bent pages. The binders are made from a tough, 'deer-hide tan' vinyl, with the Earth Garden name and logo stamped in gold foil on the cover and spine.



ENERGY WORKS!

Home Energy Systems

By Keith Smith

Nelson, Melbourne, 1985, large format paperback, 211 pages, illustrated. ☐ $19.95 posted.

Why spend the rest of your life paying someone else for your electricity? Here's how to plug in the renewable energy of the sun, wind or water using an efficient 12V or 240V solar electric system, wind generator or water turbine. Run lights, radio, TV, computers, tools and appliances wherever you live.

"The major part of this book is devoted to practical issues, hardware and actual installations.

". . . This book should appeal to anyone wth an interest in the supply of energy to weekenders, farms or other remote dwellings or even to the suburban household." — Dr C. J. L. Cornish of Murdoch University, WA, in *APACE WA Newletter*.

HARD TIMES HANDBOOK

Survive — and thrive!

Keith & Irene Smith

Nelson, 1986, 204 pages, 70 illustrations. ☐

This is the second, corrected edition of our practical book of skills, strategies and short-cuts for urban survival. HARD TIMES HANDBOOK outlines a new, self-reliant approach to city living. It tells you how to do more with less, be prepared for food shortages and emergencies, save energy, make money without a job and manage your food supply. Make bread, yoghurt, soft cheese, candles and soap. There are 150 recipes for cheap, healthy tucker and 180 money-saving household hints.

-SELF SUFFICIENCY AND PLANET CARE-

EARTH GARDEN

—FOR BUSH OR CITY ALTERNATIVES—

Number 68 — August/September 1989

•Front Cover: There's nothing like an organically grown winter cabbage to put a smile on your face — just ask Jill Redwood.
•Back Cover: "A good night's sleep in a cheap youth hostel and it's off to work we go . . . pity 'bout the bedbugs." Bethany Alldridge, who regularly contributes photography to Earth Garden, caught these water buffalo at Chiang Mai in Thailand during her current Asian adventure. This month's tree tax will be donated to the South East Forest Alliance in New South Wales.

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Founded by Keith & Irene Smith, 1972.

Published and edited by
Camille and Alan Thomas.

Book Review Editor: **Sophie Masson.**
Illustrations by **Bronwyn Halls.**

EARTH GARDEN is Australia's original journal of self-sufficiency and alternatives. It is intended as a forum of practical ideas, shared knowledge, sources and to point towards alternatives to unfulfilling consumerist lifestyles.

It's about putting a roof over your head, growing your own food organically, aiming for appropriate, renewable home energy systems, and surviving - and thriving - in the city or the bush, with the inner changes which follow when you're in harmony with Nature.

Each issue we donate a portion of the cover price to a community group involved in tree planting or forest conservation projects to help balance the use of the partly recycled paper used for printing Earth Garden. We would like to see all publishers pay a tree tax.

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Contributions to EARTH GARDEN are welcome — sharing information and experiences with other readers strengthens the network of Earth Gardeners.

Photos, illustrations and diagrams are important when sending us contributions.

Subscribers are sustainers — for subscription details see page 56.

We welcome advertisements appropriate to the aims and ideals of EARTH GARDEN, but reserve the right to refuse ads at our discretion. Write to us for display rates.

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Dear readers,

Welcome to the August issue of Earth Garden. We've been quite busy here at Earth Garden as usual. Part of the reason for our hurry and bustle is because of Alan's impending trip to France and Britain. He will be away for three months and will be travelling around France on a Royal Enfield motorbike, camping and staying in backpackers hostels. This is the trip that Alan has been wanting to do for 10 years. After studying French for years he will at last be able to put it to good use! He will be visiting some interesting places over there that we're bound to hear about in Earth Garden.

I (Camille) will be holding fort here while Alan is away, and I don't think I'll be idle. There will be lots to do. We have put together the October issue of Earth Garden (EG 69) early so that Alan can have a decent stay overseas. We've had to do this before Alan's departure, which accounts for the early closing dates for Land Lines and Unclassifieds however, EG 69 will appear at the usual time. We haven't done this before, but Alan is desperate for a break, and the choice was to prepare the issue early, do a double issue in August, or not have an October issue at all. We hope most readers will think we chose the best publishing alternative.

Jose Robinson, a long time contributor to Earth Garden who needs no introduction, is not well at the moment. We know this must be a tedious and difficult time for you Jose and our thoughts are with you.

As I write this we have been bombarded with news reports about Bob Hawke's Environment Statement. The Statement, delivered at Wentworth in New South Wales on the banks of the Darling River, was proclaimed to be the most far-reaching environmental programme by any Government. This claim is nonsense and while there are some excellent moves announced in the Statement, overall it is sadly lacking in many areas of environmental concern. Spending over 320 million dollars to help eradicate soil degradation and salinity problems is the best part of the Statement. All Earth Garden readers who have a love of working with the soil and an understanding of Australian soil problems will welcome this change of land-care direction. It seems that this is another vindication of the approach to living and using resources which has been promoted in Earth Garden since 1972.

The soil programme has been a great example of co-operation between the Australian Conservation Foundation (ACF) and the National Farmers' Federation. Sometimes there has been suspicion and mistrust between New Settlers and traditional farmers. Isn't it good to see this starting to break down? The NFF says it has established over 200 farmer tree planting groups from the Kimberleys to Tasmania, and is another indicator that we may really be entering a new era of a common approach to using the planet's resources as advocated by the Tasmanian Green Independents.

The tree planting program in the Environment Statement sounds impressive but on close examination is not what it's cracked up to be because the total number to be planted, one billion trees over ten years, is only 100 million trees planted per year. The ACF has estimated that 18 billion trees need to be planted in the Murray Darling Basin alone.

The CSIRO recently published a report which confirms the ACF's view on the required tree planting. In the 200 years since European occupation of Australia, short-sighted land management practices have meant that Australia has lost one third of its forest cover. Even today, for example, the Queensland Government is seriously considering poisoning 50 million box-poplar trees to provide more land for grazing cattle. As Federal Environment Minister, Senator Graham Richardson, said of the Queensland Government deliberations, their concern is not whether or not to destroy the trees, but simply which poison to use! If the Federal Government is fair dinkum about the environment it will stop this madness, protect National Estate Forests and ban importation of rainforest timber.

There is something seriously wrong with Government commitment to tree planting when, for example, friends of mine who run the Australian Farm Forestry Nurseries, in Cranbourne, Victoria, can produce good quality trees at a fraction of the cost of Government-produced trees. The encouraging aspect of this though, is that more and more people are realising the desperate need to plant trees, and with greater willingness and demand, the financial outlay need not be prohibitive. This is definitely a positive thing for the future of our planet.

Happy reading,

Camille & Alan

Earth People Write

Letters to Earth Garden are always very welcome.

Calling Western Australian Earth Gardeners

Dear Alan and Camille,

I have been considering living an alternate, non-consumerist lifestyle for some time now and find myself wondering how to start it all off. I have a secure, well paid, low pressure job in Perth and have started saving, slowly, towards the big escape. However I would dearly like to meet and talk with others in my position and those who have realised these ambitions. My ultimate destination would be the beautiful south-west of Western Australia and it's people in alternate communities within this region that I'd like to meet. So if any of your readers would be willing to oblige a hard working soul like myself, I would be most interested in hearing from them.

Best wishes and kindest regards,

Peter Todd, 10 Pembroke Street, Bicton, WA, 6157.

Bob Rich fights toxic termite sprays

Dear Earth Garden readers,

Persistent insecticides are widely used in Australia to prevent termite attacks on houses. Their use is compulsory in some places. These chemicals are harmful to human health, penetrate the air space of the house even if applied in accordance with the Australian Standards, and cause long-standing environmental damage.

What is worse, it seems that they are not even effective as a permanent preventive measure. I have been told of several cases where a house was treated one or more times, yet suffered a subsequent termite attack. I intend to campaign for the banning of these persistent pesticides, and for their replacement with techniques which are at least as effective, but not harmful to human health or the environment. Such techniques exist.

I need evidence to support my case, and hope that readers can help me. What I am looking for is actual cases where the subfloor or underslab space has been poisoned with aldrin, heptachlor or chlordane (one of the cyclodiene pesticides) or chlorpyrifos or permethrin (organophosphorus pesticides) — and yet, some time later, termites have got in.

As many as possible of the following items of information would be appreciated: name of owner/occupier; address of premises; type of structure (for example detached private dwelling); number of times house was treated; for each treatment name of licensed Pest Control Operator or company, date of treatment, and chemical used (if known); date termite infestation was discovered; and action taken to get rid of termites.

Please send me this information as soon as possible. The authorities are hard to convince on health or environmental grounds, but they can't ignore a stack of cases where the stuff has failed.

Yours in peace,

Dr Robert Rich, PO Box 214, Healesville, Vic, 3777.

Bicycle tour sponsors wanted

Dear EG Folk,

Hello to you all. Between July and October 1988 I did a bicycle tour from Cairns to Adelaide, and around Tasmania. My age is 61. In June 1989 I began biking the remainder between Adelaide and Townsville via Perth, Broome and Darwin.

If any readers could write to tell me of a reputable business who could arrange sponsors for such future journeys I would be grateful. I understand there are agencies who arrange sponsor firms for such things and apparently charge a percentage of sponsorship they obtain. At present I meet all my own costs and would welcome receiving just my bare daily outgoings to sponsor any charity, cause or business. Any advice thus would be most welcome.

Anyone on the route mentioned interested in bicycle touring who would like me to stay overnight when passing their way please send an address and phone number.

Ken Everett, PO Box 16, Shannon, Horowhenua, New Zealand.

Help with a meat press?

The Editor,

I have searched high and low here in Canberra and am unable to purchase a meat press. Perhaps a reader may know of a store somewhere that may still have one on its shelves with instructions how to use it.

I am new to cooking and want to learn how to press tongue, make brawn and whatever else I can learn to make. I trust that readers may be able to help. Thanking you in anticipation. Yours faithfully,

Robert Skinner, PO Box 99, Kingston, ACT, 2604.

Good news from Germany

Dear Editors,

Being of German origin, I sometimes have the chance to read publications in my native language, and this time I came across four recent developments which got me quite excited, and which I am sure will be of interest to some Earth Garden readers.

1. Cheaper solar energy. At the moment electricity from solar energy costs 2 DMarks per one kilowatt-hour. A new manufacturing plant will reduce this to 15 Pfenig. It makes use of 80 percent of the solar energy available (compared with only 10 percent in present systems). It uses the cheap substance magnesium hydride for chemical reactions with hydrogen which can be continuously repeated, resulting in temperatures of as much as 500 °C. As hydrogen is stored separately, solar energy is also available in the (German!) winter. It will probably take another five years before this type of equipment will be on the open market.
2. Electrically-powered bicycle. It looks like a normal, comfortable push bike, but has a small motor behind the seat, which helps to climb steep hills or combat longer distances noiselessly, effortessly, and free of pollution (you can recharge from a solar power source). Maximum distance 40 km. Top speed 20 km/h. What a way to go shopping or visit a friend — no car needed. I shall try and find out more details, and I will be happy to pass information on to anyone interested. (I know somebody with a smashed leg who can't run a normal bike, but who would just love to have one of these).
3. Economy stoves. In Third World countries, more wood is needed as fuel for cooking than can be supplied by dwindling forests. To help break this vicious cycle, the German Company for Technical Co-operation has designed a series of highly efficient little stoves which burn different fuels — like cotton stems, the husks of coconuts, biogas or solar power. To popularise the stoves, members of the team travel to the remotest corners of the globe to demonstrate the energy-saving stoves right in front of the people who need them.
4. Organic farming. A farming family in Bavaria have put into practice what Fukuoka (*The One Straw Revolution*) has long been talking about. They do not use a plough. The 'new' technique puts a complete stop to the blowing away of precious top soil by the wind. It preserves the soil's natural structure, with the added bonus that there are ten times more earth worms present than in neighbouring fields. Not using a plough also saves fuel. Conventional farmers use between 100 and 200 litres of diesel per hectare per year. Now they need only 50 litres to run the small, specially designed machine which helps them scatter and mulch the seeds all in one operation, over their 400 hectares of land. Less pollution, greater savings, a healthier place. Definitely a step in the right direction and a persuasive trend-setter. In all, 1700 farms with an area of more than 30,000 hectares are run on an organic or biodynamic basis in this region.

It's nice to have something positive to report for a change.

Mrs Karin Mitchell, 49 Greville Street, Prahran, Victoria, 3181.

Rainforest species seeds available for regeneration groups

Dear Friends,

BVRS is a small mail order business specialising in supplying seed for large scale regeneration and afforestation projects. I am writing to ask if readers know of any groups that may be interested in rainforest generating programs. Occasionally we collect more seed than we can sell or grow ourselves, so we hope to give regeneration groups the chance to grow rainforest trees from seed. This should save money and increase the trees to be planted.

We would only need the cost of packaging and postage refunded and we would be happy to give any advice on propagation and species selection, etc. Looking forward to hearing from you. Yours in peace,

Mark Baird & Johanna Treweeke, Bellingen Valley Rainforest Seeds, Private Bag, Bellingen, NSW, 2454.

Fighting the dreaded couch grass

Dear Earth Garden,

Can someone supply me with information on how couch grass can be destroyed and/or stopped from spreading. It has appeared on our block and rapidly spreads into the garden beds and no-mow grass areas we've established. P.S. I'm also chasing an alcoholic apple cider recipe. Thanks,

Robyn Cross, 55 French Street, Clermont, Qld, 4721.

Banding together to survive

Dear Earth Gardeners,

I have written once before tc Earth Garden but am now writing with a similar idea to D R Sanders in the Earth People Write section of the April/May edition.

I am a pensioner with three kids, a stubborn spirit and an anger at the system in general that treads on the poor, pollutes and destroys our planet. I have written my idea to the Prime Minister but have doubts that it will even be read. In anticipation of this happening I'm hoping to stir enough people's hopes and hearts to join me in a happier hard working future. If I can get enough like minded people to join me in this proposal we can succeed not matter what odds say we can't.

My idea is this: alone the lower wage earners, unemployed, pensioners and poor of this country can never hope to have homes of their own. But with a small amount of capital, tools, hard work and determination they can.

If a group or groups of we people in this position pooled our resources and bought bush land we could build homes as the settlers did of bark, rock, wood, mudbrick or wattle and daub. With tanks, pumps and a little genius (natural creeks help), then add some generators and hard work and you have the basis of a stable surviving community. For every tree removed to do this, we could plant two to repair any damage. Instead of living in an environment layered in pollutants, poisons, fake fertiliser and waste, apply every known conservation measure to ensure healthy living for both our children and ourselves. Grow whatever is possible in the earth, glass houses and greenhouses and apply technology to help both the people and the planet. Not only would the cost of living drop considerably but so would stress, and a bonus would be the regaining of self worth and the skills necessary for survival on a planet in crisis and getting worse by the hour.

If anyone out there is interested in my idea, it can stand criticism or help. Please write and let me know.

Jenni Wright, C/- Post Office, Gormandale, Victoria 3873.

Victorian cheap land scheme

Dear readers,

Do you want to lead a self sufficient lifestyle, but lack the money to buy land to get yourself going? We intend putting a submission to the Victorian Government to obtain land in the Millewa Region. This land has now reverted to the Crown, and could be divided into 5 to 10 acre lots, and then made available to people on low incomes to do just that: get going.

The reason this proposal may well succeed is that services like water, power, schools and roads are already established but presently only service a very small population. So services are not cost effective. They actually have about 120 km of pipeline water in the region, and if more people were living in the area, the Government wouldn't be charging the rest of Victoria's ratepayers for a few rich wheat farmers to benefit.

The area is basically from Mildura towards the South Australian border. It's an ideal growing area, very hot to warm most of the year, with only very occasional frosts and only in some years. What's left of the Mallee scrub is very beautiful and we would need to keep conservation issues to the fore even when we did get the land. The soil is suitable for mudbrick making, and there are quantities of local limestone still available for house construction.

A precedent has already been set, as large areas of Crown land in this region have been leased for years by farmers for peppercorn fees. So now we will be demanding an equal go for those on low incomes who want to be self sufficient and get out of the rat race.

We need a response to this letter, so that we have some idea of the number of people who may be interested — the Government likes statistics. Even if you say "yes", you won't be in any way committed at the moment, as we are only in the chrysalis stage. If you have any information that might help us avoid pitfalls or bright ideas to help us succeed in this ambitious project please write or telephone (050) 245 385. Yours,

Doris J Byron, 14 Armagh Crescent, Irymple, Victoria, 3498.

Natural asthmatic remedies?

Dear Alan and Camille,

I would be obliged if any readers could give me some advice. I am an asthmatic who is not getting anywhere with conventional medicine. I would like to hear from any readers who have personal experience of remedies which have worked for them. As Brisbane is not a very healthy place for asthmatics, I would also like to hear of any asthmatics who have found certain areas to be of benefit to them. Yours faithfully,

Kevin, 16 Lowry Street, Inala, Qld, 4077.

Help for Australia's future

Dear readers,

I have been reading Earth Garden for many years now — it's one of the best and brings joy to my heart to know that people care enough about their environment and each other as you all prove through your letters.

I'm a mother of four lovely young children and there have been several issues in recent news items that concern me and my family and naturally all the world. I have begun a group, an organisation, an idea or whatever you may conceive it to be.

We all know by now that each and every one of us has to save the world environment from destruction. I have started a business selling and planting trees to regenerate the forests. We as a group also sell gift cards, posters and paintings, the proceeds of which go towards the cause of our world's future and making sure our kids and their kids can still run in the open air, eat natural foods and honestly have a future to look forward to.

Another issue which concerns us is the homeless children situation. Being a mother my heart cries out to these children that have to live in bins and on the streets of our cities, with no help or support from adults.

We need these children; they are strong, young, energetic and looking for someone to help them — they can help us and in turn themselves.

I am working on feeding, clothing and mainly giving some sort of shelter to them. I feel that they have a great deal to contribute to our future and to their children's future.

I'm asking you, the readers of this magazine to look deeply within your hearts and honestly, practically think what can you do to help. Donations of money, no matter how small, or seeds of any kind or even advice is very much appreciated and is assured to be used for our greatest asset, our world and humanity.

We have a rainforest acreage here in the far north, the climate is wonderfully warm, tropical lush forests surround us, things grow quickly and easily here and I feel that this area is a good place to grow for the future. I'm looking forward to your response and advice.

Sharon Kalnins, Holding Hands for Humanity, c/- 176 Mulgrave Road, Cairns, Far North Queensland, 4870.

SUBSCRIBERS ARE SUSTAINERS

See page 56 for sustenance and subscription details.

Meters and multimeters for solar systems

In this, the second of a three part series of articles on tools for solar power systems, Greg explains clearly and concisely the functions and uses of meters for monitoring solar systems.

by Greg Baker
Braidwood, New South Wales.

ANY owner of a solar electric system will at some stage need to measure what the system is or is not doing. There are three types of measurement you'll need to make: voltage, current and sometimes, resistance.

In EG 64 Peter Pedals explained in some detail voltage and current. Voltage is basically the electrical pressure of the power source and is measured in volts. Current is the rate of flow of electrons past a point in the system and is measured in amps. Resistance, as the word suggests, is a measure of the difficulty that the electrons have in moving around the circuit.

To make these measurements, you will need a meter. There are two sorts of meters which are relevant to a solar system. One is a multi-purpose meter which can measure a wide range of voltages, currents and resistances in one instrument. This, for obvious reasons, is called a multimeter.

The other sort of meter is a purpose-designed instrument which can only measure a single voltage or current range. It is merely called a meter, or sometimes a panel meter because it is often mounted in the front panel of a piece of electrical or electronic gear.

Multimeters

Multimeters come in analogue or digital form. The difference between analogue and digital meters is much the same as the difference between an analogue wrist watch (with moving hands) and a digital wrist watch (with the time displayed as numbers). Analogue meters have a series of graduated scales and a pointer. When connected to a circuit, the needle moves to a point on the scale. Then it is simple to read off the value from that scale. Digital meters present the same information as numbers.

Meter accuracy

To give an accurate reading a meter should not change the system operation when it is attached to any circuit. Meter accuracy is often quoted as a percentage of the full scale reading. Thus an analogue meter which is two percent accurate and set on the 20 volt range will give readings to within 0.4 volts. Digital voltmeters are far more accurate, usually being of the order of 0.25 percent accuracy. This means that for solar system voltages the error of digital meters will be negligible for all practical purposes.

Another way to specify accuracy is to quote the so-called meter input resistance. The higher this resistance, the less effect the meter will have on the circuit under test and the more accurate will be the reading. Analogue meters usually have input resistances in the range of 2,000 to 100,000 ohms per volt and the price of the meter increases with this resistance. The input resistance of digital meters starts at around 10,000,000 ohms and goes much higher and again increases with the price of the meter.

Remember that analogue meters have a larger effect on a circuit and hence are not as accurate as digital meters.

How to use a multimeter

It is essential to read the instruction booklet which comes with your multimeter. It will tell you how to connect the meter to measure voltage, current and resistance. Some meters require that you rotate a switch to select the meter range you need, some that the two meter leads be plugged into a specified pair from a range of sockets in the meter case. Make sure that you understand what to do before you connect the meter to a circuit.

Voltage measurements

In general it is safest to begin with the largest voltage range on your meter and work down to the correct range when you know the sort of size of the voltage you are measuring. The meter leads must be across the positive and negative wires to give a reading: remember that you are measuring the electrical pressure between the wires.

Voltage measurements are useful in two main cases. One is to check which wire is positive and which is negative before you connect them to an appliance. Connect the meter positive lead to the wire you believe to be positive, the negative lead to the other. If the meter gives a reading such that the needle lies on the selected voltage scale or, in the case of a good digital meter, a positive reading, the leads are connected to the correct wires. If the reading is negative on a digital meter or the needle on an analogue meter tries to break out of the left side of the case, the wires are the wrong way around.

The other use of a (mainly digital) meter is to check the state of charge of your storage batteries or cells. This is possible because the voltage of lead-acid cells varies in a predictable fashion with their state of charge. A fully charged two volt cell really has an open circuit voltage of as high as about 2.3 volts. This makes a nominally 12 volt system — which is six 2 volt cells connected in series — have a fully charged voltage of about 13.8 volts. A 24 volt system — twelve 2 volt cells in series — has a fully charged voltage of about 27.6 volts. The voltage for a fully discharged cell is typically 1.9 volts and a half discharged one is typically 2.1 volts.

The battery manufacturer can tell you these voltages for your cells or batteries. Note that it is important to obtain these voltages and not use my figures as accurate for your cells.

To determine the state of charge simply disconnect the batteries or cells from the rest of the system, select the meter range for the voltage you want to test — 2.3 volts, 13.8 volts or 27.6 volts — and connect the meter across the battery or cell.

Then use your manufacturer's specifications and the voltage reading to tell you the state of charge. An analogue meter will not be as accurate here as the digital meter but it will give a fair indication of the appropriate state of charge.

Current measurements

Current is a measure of the rate of electricity flow in a circuit. It is sometimes useful to know how many amps your panels are putting into the storage cells and how many amps your electrical appliances are drawing from the system. These measurements help you to reach balance over the longer term between the power available and how much you are using and to check on the operation of the system.

To measure current you will need to connect the meter into the circuit under consideration. This will involve disconnecting the circuit at a terminal and inserting the meter as though it were part of the system.

Make sure you have the leads the right way around for the current flowing in the circuit or the meter needle will point the wrong way and perhaps damage the mechanism. Refer to your meter booklet if you are unsure of how to connect the leads.

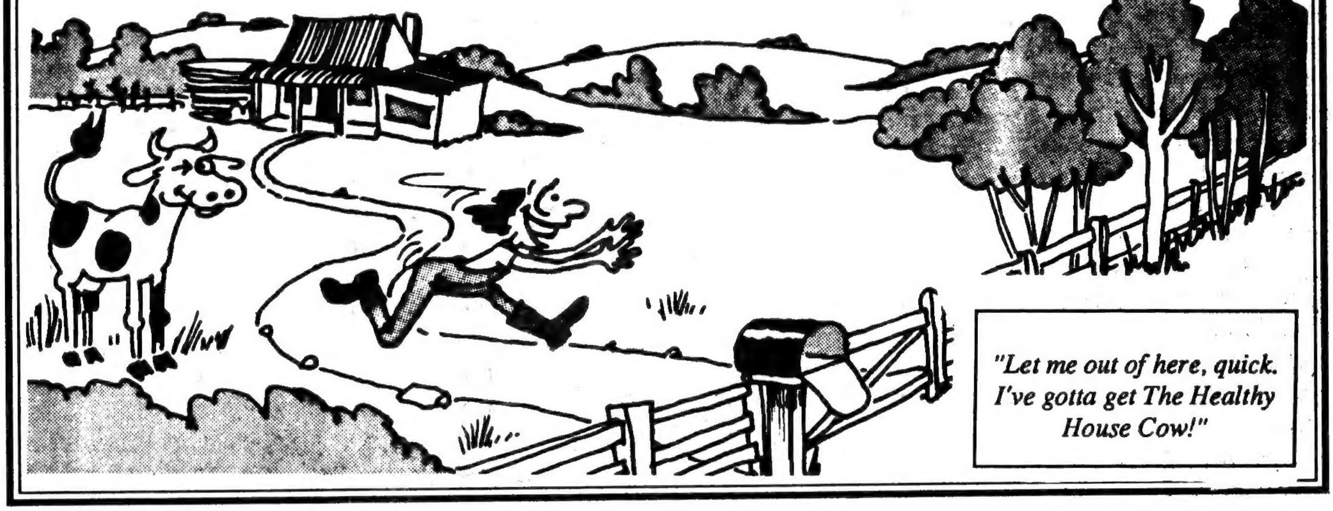
It is essential also to check the maximum current capacity of your meter before you connect it. Many meters will measure currents of only about a half amp or less while most system currents are much higher. Such meters will be damaged by system current flows. Prefer a meter with a 10 amp current capacity if you think you will want to measure currents on a regular basis. Remember even then though that it only needs four standard twelve volt solar panels to exceed that 10 amps, so don't use it to check system input from all panels at once.

•continued on page 49

The Healthy House Cow

written and illustrated by Marja Fitzgerald

Australia's first house cow book written from an organic, wholistic perspective. Everything from fencing to cheesemaking and organic health solutions. 'The Healthy House Cow', published by Earth Garden, is now available. 144 pages, large format paperback, and full of useful information for prospective or current house cow owners. $18.00 posted - see page 56 for ordering details.


"Let me out of here, quick. I've gotta get The Healthy House Cow!"

Growing Paw Paws Organically

by Liz Sinnamon

Kenilworth, Queensland.

FOR a delicious tropical breakfast, nothing surpasses luscious ripe paw paw. These fruits are relatively easy to grow organically, with excesses always in demand, either in exchange for other produce, or to supply the organic market. Paw paws are rich in carotin, vitamins A and C, as well as riboflavin and thiamine, are easy to digest and are an invaluable addition to the diet.

Many growers start trees from their own seed, often with disappointing results. This may be due to seed being taken from inferior fruit or under-productive trees. Seedlings should be obtained from a reputable seedling nursery, where seed is comes from specially selected quality trees bearing top grade fruit.

Twenty to thirty trees are ample for those interested in self-sufficiency, although trees should be replaced every three to four years.

Preparing for planting

To achieve efficient grass and weed control, prepare the area to be planted by thoroughly rotary hoeing or digging and adding large amounts of poultry manure and dolomite at least two months before planting the seedling trees. The whole area should then be covered with two or three layers of newspaper, then four or five inches of blady grass hay or straw, leaving pot spaces about five feet apart.

Laying the newspapers and mulch is best undertaken during the early hours of the morning before any wind rises, because laying newspaper even in a slight breeze can be difficult. This method is very effective for controlling weeds and grass during the early growth stages. Although most authorities recommend a spacing of over six feet, by spacing the plants closer together, a good thick canopy of leaves is formed as the plants mature, blocking out light and successfully inhibiting weed growth.

Seedlings are usually grown three to a container. All three are planted together, with five feet spacings between groups. As the trees grow the males can be thinned out, because it is only necessary to have one male to every eight female plants (a bit like chooks).

The mulching technique gives excellent moisture retention with improved soil quality. Thinning is carried out after the first flowering when it is possible to distinguish between the male and female plants.

Nourishment

At this time apply approximately 10 g of boron and 30 g of sulphur to each tree, under the mulch. Sea minerals, or liquid seaweed fertiliser should be used as a foliage spray every two months, which will assist fruit set and supply all necessary trace elements. The sulphur seems to sweeten the fruit and should be applied at least twice yearly.

Pests and diseases

Pests and diseases can be dealt with by various natural methods. Hundreds of spiders will come to live in the trees, and these are well known as great predators, particularly of fruit fly. Numerous tiny tree frogs, which will thrive in the cool moist micro-climate created under the canopy of leaves, also play their part in biological control, so that pests should not be a great problem. Australian flowering native shrubs planted nearby will attract birds and act as a further pest control.

The most serious disease affecting paw paws is dieback, which is caused by fungus rot in the root system. Heavy mulching with mulch hay mixed with chicken manure will keep the trees extremely healthy and small losses will not reduce crop yields significantly.

Harvesting should be undertaken during the early morning, before the hot tropical or sub-tropical sun and humidity makes picking and uncomfortable task.

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Some thoughts on house design

by Marja Fitzgerald
Mongogarie, New South Wales.

OUR present house is being eaten by white ants. It is an old weatherboard house that began life as a couple of rooms, and was added to over the years. It has no ant capping. When we bought it, nearly 10 years ago, we had it poisoned by Flick. The poison was Heptachlor. We have since discovered that Heptachlor is banned in the USA. Heptachlor has a half-life of 12 years, which means that in 12 years half of it will still be actively poisonous.

The white ants returned within a few years of poisoning. As the poison had made us feel sick, we didn't want to repeat the process. So we decided we would have to build ourselves a new house eventually. "Eventually" has arrived. We hope our old house will last until we can move into the new one.

The first step is choosing a site. A northerly aspect is a big advantage for passive solar heating and cooling. Other considerations were: distance from the road, height above possible flood levels, bushfire safety of the site, distance from water supply and gravity feed considerations, and view.

We chose a site "in the belly of the dragon" — the preferred Feng-Shui site. This is on the slope of a hill. Here we are somewhat protected (by the hill) from storms, and we should be above the flood level.

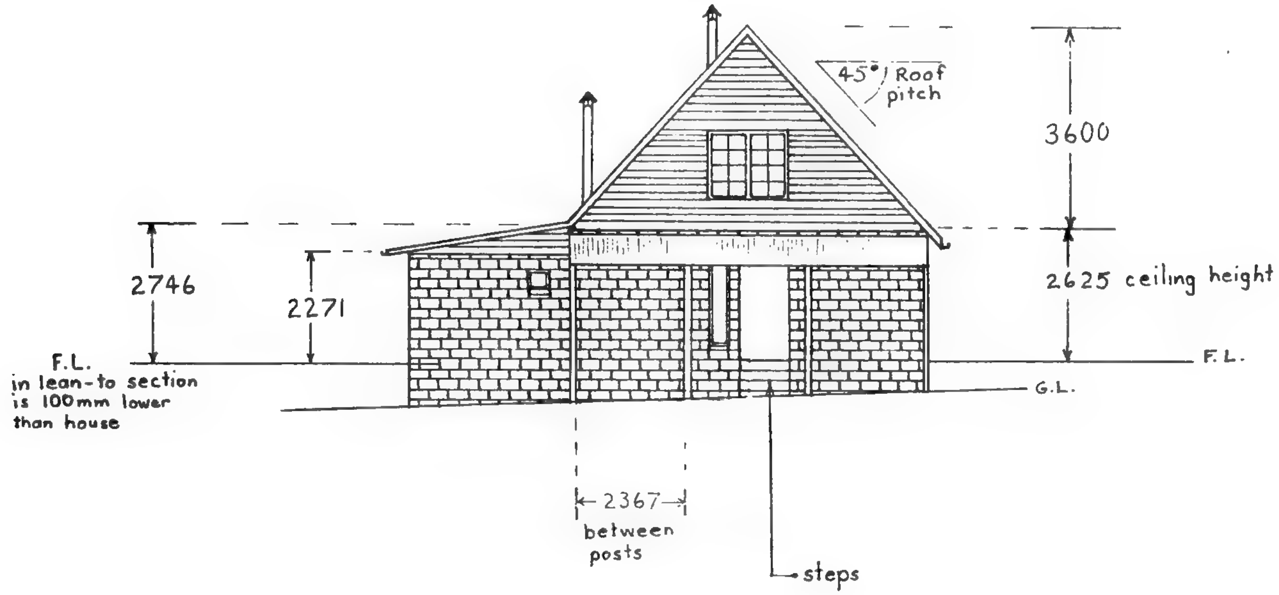
I took many factors into consideration when designing the house. It is a physical impossibility to design the 'perfect' house, because different factors work against each other. Economic factors, practical factors, aesthetics all have to be balanced against each other. For example: large windows are lovely to make the best of the views, but large areas of glass allow heat to enter or escape easily — something to consider carefully in hot parts of Australia.

A gravity-fed water supply is very worthwhile if you can arrange it. Even good pressure pumps need occasional fixing, as we know from experience. So our new house is to be far enough down the hill to gravity feed from our hill-top tank. This 5,000 gallon tank is filled by our windmill.

All our plumbing inlets and outlets in the new house are close together. This way the hot water hasn't far to go, and little heat will be lost warming the pipes. For a hot water system that relies on a fuel stove, solar, or off-peak it is important not to waste the heat by warming great lengths of pipe.

Here in northern New South Wales it is more important to design for coolness than warmth — certainly where we are. Having lived here for 10 years, we find that the weather spends more time being too hot than too cold. It isn't hard to warm ourselves up — splitting some firewood is a traditional method.

Cooling down is more difficult. So our house is designed for coolness. However, a house that is designed for coolness in summer will also tend to be warm and snug in winter.



The west elevation of Marja's house plan.

Our lounge room will be the coolest room in the house barring the cellar. It is insulated by rooms to the east and west. To the north is a verandah enclosed on the west and east, fly-screened on the open northern side. This verandah insulates against summer heat while allowing sunlight to enter in winter, when the sun is closer to the horizon. The high-pitched roof gives protection from heat and cold above, and contains our loft-bedroom. In summer the loft will cool down faster in the cool evening than the rest of the house, and so will be a cool place to sleep.

In summer we'll shelter from the midday heat in the lounge room, and by evening the easterly kitchen will be nice and cool for cooking.

> **"See your building inspector before you've finished all your plans."**

In our brief winter the north-facing enclosed verandah will probably be our favourite hang-out when we're not busy. It will be sheltered from the cold southerly and westerly breezes, and catch sunlight through the full-frontal flywire.

The cellar, for Steve's wines, and my cheeses if cool enough, is on the south side of the house, well away from the kitchen stove and protected on three sides by cooler rooms. On the rare occasions when we will light our lounge room fire, there will still be a concrete block wall between the fire-warmed area and the cellar.

The 'dining room' is actually a library with the dining table only for formal occasions. The southern corner of it is a little office area which will be screened by a bookcase to form a quiet area.

When planning our house I began with a floor plan. Before its final form I changed it many times, showing the plan to numerous people and listening to their comments. Sometimes these comments were sufficiently perceptive to make me change the plan; at other times the criticisms were not valid to our lifestyle, though valid in their own.

Finally the floor plan was finished to our satisfaction. Now came the time to draw up final plans. I didn't study Technical Drawing at school, so it took me quite a long time. To draw plans that would be useful to ourselves as well as fulfilling Council requirements I had to read numerous building books. This helped me understand what each aspect of the design would entail. Reading the building books caused me again to modify my design somewhat, for economic reasons and ease of building.

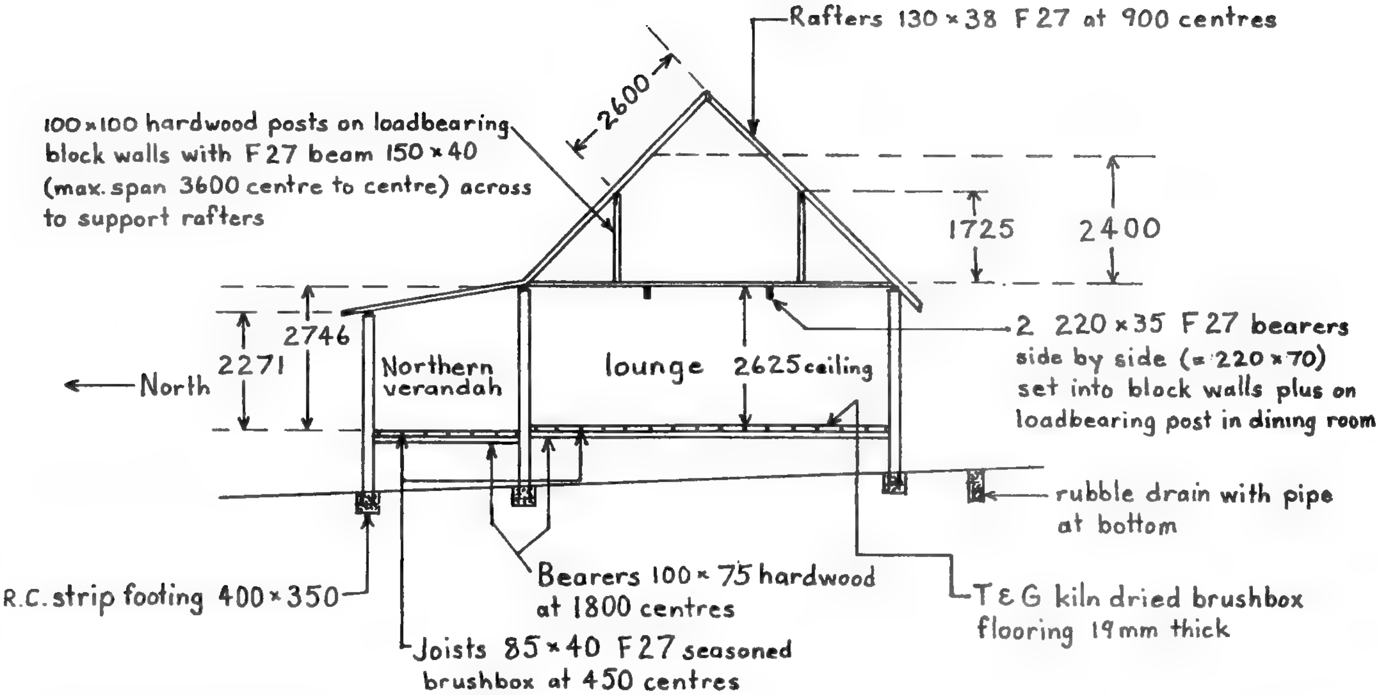
There are people — architects and draftspeople — who will draw your plans to Council specifications for a fee. This was not our choice, for two reasons. Firstly it will cost anywhere from $250 to $800, depending on complexity and whether you use an architect or draftsperson. Secondly, but even more importantly, by having to draw how everything fits together you are forced to think carefully about each aspect of your house. This helps you pick up any drawbacks or difficulties you may not have thought of before. It also makes you think about exactly how you will build each section. Sizes of beams, joists, bearers, rafters, lintels and the like have to vary according to the distance between supports (span) and strength (or F-rating) of timber used. Seasoned timber is stronger than 'green' timber, but also more expensive. Hardwoods are stronger than softwoods. The factors need to be taken into account when planning what type and sizes of timber you intend to use.

I've found that a fat exercise book, my 'House Book', is a very useful tool. In one end of it I make a note of useful information I come across in reading. In the middle I write down all house expenses, and at the other end I make notes of anything useful gleaned while talking to other owner builders. Also in this end I write useful addresses, details and date of relevant phone calls, quotes, and details of conversations with the building inspector. As well, I write down relevant measurements and calculations. Sizes of fittings such as stove, sink, bath, fridge and the like; heights above floor level of each window and their actual dimensions, and calculations of materials — all are written into my book. Information I need to find out is listed here too. It is very satisfying to read through lists of questions a month later, and realise that you now know most of the answers. Trouble is, you will also know more that you need to find out!

This book has been invaluable. I take it with me whenever there's a chance of scoring some useful information. Reading through it refreshes my memory about the things I've learnt and helps to cheer me up when I think we'll never get there.

To get Council permission to build in our shire (as in most) you have to submit plans and specifications. The plans consist of a site plan, a side view of each side of the house (called elevations) a floor plan for each floor, a section (cut-away view) and in some cases a plan of the footings. Details of some parts such as a fireplace may also be needed. The drawings must be to scale. The usual scale for all except the site plan and details is 100:1. I found it easiest to use graph paper, where one centimetre shows one metre. These can then be photostated and the graph lines do not show. The originals with the graph lines are excellent for your own use as the sizes are easy to work out at a glance. By the way, "white-out" correction fluid also does not show on photostats!

When I had drawn the ground floor plan, the footings


Rafters 130 × 38 F 27 at 900 centres
2600
100 × 100 hardwood posts on loadbearing block walls with F 27 beam 150 × 40 (max. span 3600 centre to centre) across to support rafters
1725
2400
2746
2271
North
Northern verandah
lounge
2625 ceiling
2 220 × 35 F 27 bearers side by side (= 220 × 70) set into block walls plus on loadbearing post in dining room
rubble drain with pipe at bottom
R.C. strip footing 400 × 350
Bearers 100 × 75 hardwood at 1800 centres
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Joists 85 × 40 F 27 seasoned brushbox at 450 centres

A section plan of Marja's house.

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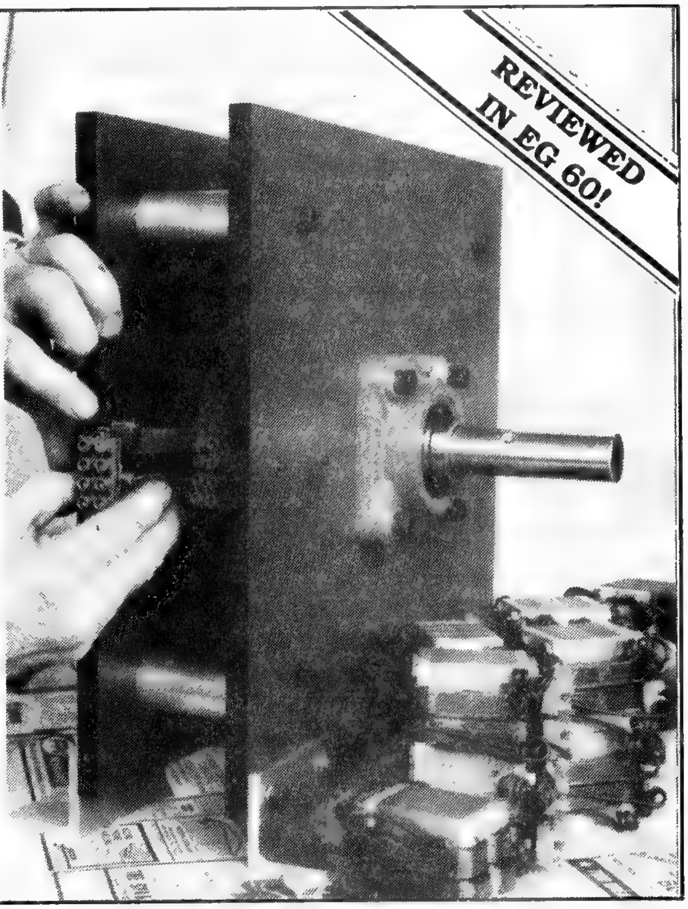

and one elevation, I rang our local building inspector and made an appointment. In my House Book I had been making a list of questions to ask him. Armed with this list and the plans drawn so far, I nervously turned up at the appointed time. To begin with he was a little gruff but soon he realised that I had been learning as much as I could and was trying very hard to make our house a strong, solid and Council-approved structure. He became very helpful and I took pages of useful notes. He suggested a minor-seeming but excellent change in the roof detail, which will improve the house considerably.

I don't know if all building inspectors are as knowledgeable as ours — he has certainly already saved us time and money. He also boosted my confidence by telling me that my plans as drawn so far were quite acceptable. This was a relief as I'd never drawn house plans before.

Based on my experience I'd advise future owner-builders to see your building inspector before you've finished all your plans. Make sure you will know what he is talking about — learn your building terms by reading the relevant books in the building section of your library. If you end up having to re-draw some of your plans because of this interview (as I did with the roof line) it's better at this stage than having your finished application knocked back. If you're lucky your building inspector may also give you useful information. Remember though, that he's the expert, and treat him as one. It's as well to start your relationship with him on a good footing... after all, you'll be seeing quite a bit of him before the house is finished. He can be a useful source of information if he cares to share his knowledge — so be pleasant to encourage this flow of information.

The first official step towards building a house in our shire is to submit a development plan. This goes to the town planner's department in Council. Our development plan had to include a filled-in form, a site plan, floor plan, one elevation, and $40.

Once you receive development permission, the next step in New South Wales is to send a copy of your plans, a filled-in form, and $30 to the Builder's Licensing Board. A form should be available from your Council. Once you have your Owner Builder's Permit you can finally apply to Council for permission to build. Our Council requires three copies of the complete plans, as listed above, two copies of the specifications, a copy of your Owner Builder's Permit, and the fee.

Booklets of specifications can usually be bought from the Council for a couple of dollars. All you have to do then is fill in the blanks. The Building Fee is worked out as a percentage of the Council's estimate of your house cost. This cost includes labour, even though it is your own.

Another cost at this stage is a compulsory payment to the Builder's Labourer's Superannuation Fund. This is also a percentage of the Council's estimate of the cost of your house. At present this percentage stands at 0.5 percent. So a house estimated at $50,000 will have a BLSF levy of $250.

Your Owner Builder's Permit will allow you to get a discount on building materials in most building supplies outlets. This discount ranges between 5 and 10 percent. At least there's some compensation for all the fees and red tape!

Once your plans are passed, you are at last able to begin building. Finally the months of reading, researching, drawing and re-drawing plans can begin to bear fruit.

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by Jackie French

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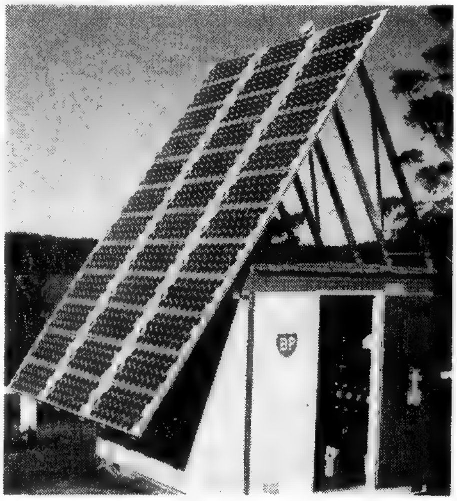

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Home grown hair care

In the article below Jackie describes a wonderful range of homemade natural hair care possibilities, most from readily available garden offerings. What a great idea!

by Jackie French

Braidwood, New South Wales.

IT BEGAN when I was without a car, (a day's walk from town) and out of shampoo. I'm one of those people who feel ants crawling down their face if they don't wash their hair every day. I experimented.

The easiest alternative shampoo was mud. Don't laugh. It took the grease out. (Notice how silty water lathers into foam in a flood?). Package mud up in flowered plastic bottles and the supermarkets would be full of it.

Actually urine is supposed to be excellent too — a couple of days old and ammoniacal. It does take the grease out of sheep's wool wonderfully, but I've never tried it on myself. I'm sure it would give my hair all the blonde lights of an advertiser's dream. But with so many other alternatives to try. . .

Like egg yolks. These are best as a conditioner — rub them in after shampooing, leave for a few minutes and wash off — but they clean your hair as well. Or try an infusion of soapwort. Pick a handful of leaves, bung them in the blender or a moulie, cover with water, shake, strain and use the liquid in your hair. Ivy leaves aren't bad either, or blackwood leaves.

Hair rinse for shining hair

Take a handful of rosemary or chamomile. Pour over a cup of boiling water, let it steep for half an hour, then use as a final rinse for your hair.

Dry shampoo

Take orris root, ground rosemary or arrowroot or a combination of any of them. Dry them thoroughly in the oven, grind to a powder and brush through the hair. Leave for ten minutes then brush out again. The powder should take both grease and dirt with it.

Chamomile shampoo

Make a cup of hot chamomile tea by pouring boiling water over a dessertspoon of dried flowers and leaving it to steep for five minutes. Drain the tea off the flowers, add a teaspoon of soap flakes (Lux is good) and a teaspoon of borax. Mix well. Use the whole cupful to wash your hair. Chamomile tea is a brightening rinse for fair hair.

Egg and other shampoos

Take the yolks of two eggs, add the juice of two lemons, mix, and use instead of shampoo.

Hair conditioners

These are usually acidic to remove the alkaline residues of shampoos. Steep a handful of rosemary in lemon juice, and add a teaspoon full to the final rinsing water. Pour boiling water over sage, yarrow, fennel or lime (linden) flowers — any combination is effective. Leave to steep for half an hour and use the liquid to rinse your hair.

Hair conditioner for dry hair

Fill a glass jar half full of fennel, chamomile, rosemary or nettles. Top with sunflower oil, let it steep in the sunlight for at least a week, and shake regularly. Rub it through the hair ten minutes before washing.

To lighten hair

Steep a cup of chamomile flowers in three cups of boiling water. Use the liquid as a final rinse. This will add bright golden lights to brown hair, and gradually lighten hair with continued use.

Dyeing hair

To make a blue rinse, take a cup of elderberries, add a pinch of salt and alum (these add brightness but aren't absolutely necessary) and cover with boiling water. Leave this till it's cool and use as a final rinse. If the colour is not deep enough rub a more concentrated solution into your hair and leave on for ten minutes before rinsing off.

To mask grey hair

Make a strong sage tea by pouring a cup of boiling water onto a cup of chopped sage leaves. Leave it till it's cool, and use it as a final rinse. This will have to be repeated for several weeks.

To add golden lights to brown hair

Dig up some rhubarb root, scrub it clean of grit, dry it in the oven then pulverise in a blender. Add just enough hot water to make a pulp and rub it into your hair. Leave for half an hour then rinse off thoroughly. This preparation may leave your hair dry, so use a conditioner afterwards.

To colour grey hair brown

Soak a handful of walnut leaves or husks in water overnight. Use this as a final rinse when washing your hair.

To brighten blonde hair

Take a cup of marigold petals, pour over a cup of boiling water, leave till cool and use as a final rinse for your hair. Better results come with repeated applications.

To add reddish lights

Take some thin sections of oak bark *(Quercus robur)*, cover with boiling water, leave overnight, and use the resulting liquid to rinse your hair.

Henna (Lawsonia Inermis)

This is also known as Egyptian privet or the mignonette tree. The red henna colouring is produced from the young shoots (which produce the best colouring) or from the leaves. Henna grows to about 6 m, with brownish green leaves and fragrant red or white flowers.

Henna is a traditional hair colouring and conditioner. Small applications leave hair shining. A stronger mixture provides red lights, and an even stronger mix and the hair will absorb a rich red tone. If you don't want red hair try adding a decoction of walnut husks to turn your hair a rich brown, while a decoction of lucerne will darken hair.

Take the henna leaves and dry them thoroughly either in the oven or in sunlight. Crumple them in a paper bag till they are powdery. Add just enough water to form a paste. Alternatively, mix the paste with an egg instead of water to help condition the hair, or use lemon juice to make the final colour brighter. Heat the paste till it starts to bubble. Take it off the heat and let it cool.

Now rub oil into your scalp to protect it and apply the paste to your hair as evenly as possible, taking small strands of hair and working the paste in. Finally, wrap your head in an old towel or something you don't mind staining — or use plastic wrap and then a towel. Keep your head covered as long as the henna is on to maintain an even temperature and even colouring.

The henna colouring becomes richer the longer you leave it on. For a first attempt an hour is probably long enough for strong red lights. If you wish to deepen the colour repeat the procedure.

Rinse your hair thoroughly after using henna, then shampoo it.

Fragrant pomade or hand lotion

Take clear lard, or a combination of beeswax and oil — about two parts wax to one of oil, but you will need to experiment. Melt, and pour a very thin layer into a glass jar. Quickly add either jasmine or tuberose flowers. Wait till the lard or wax and oil have set then repeat the procedure till the jar is full. Leave this for a couple of days then melt the lard again and strain it. Repeat with more jasmine or tuberoses. Continue the procedure till the lard is strongly perfumed.

Rub this on your hands after washing or gardening.

Fragrant hand lotion

Take a cup full of any fragrant flowers — boronia, jasmine, rose petals or orange blossom. Place them in a saucepan with 500 ml of bland oil and steep gently for half an hour. *Do not bring to the boil.* Take off the heat and add 50 g of melted beeswax. Mix well. Store it in a sealed jar.

Turn your hand to dyeing

by Jackie French

Braidwood, New South Wales.

HOME dyeing is a simple way to colour anything, from clothes, sheets to tatty poodles. You can use cheap material like calico, old sheets or plain T-shirts, or even old white skirts or dresses that need brightening. Home grown colours are often subtle and distinctive, such as bush and garden shades of golds and greens and reds.

Any natural fibre can be dyed — synthetics may not take the colour evenly, or may fail to take it at all. The basic dyeing ingredients are easily grown or scavenged.

Most dyes require a mordant to 'fix' the colour, to make it deeper or richer or more permanent. Mordants include salts of alum, such as chrome, tin and copper, and are available at chemists. A few dyes however, will colour cloth without the need for a mordant. One of the earliest recorded of these is henna, which gives a red colour to hair or cloth (see the article elsewhere on natural hair care), or fixes other colours, for example black from walnut skins.

Many eucalypt species give indelible dyes when the leaves are boiled without a mordant, though these are usually soft rather than bright colours. Lemon scented gum leaves (*E citriodotra*) will produce a mild fawn coloured dye when boiled with wool or cotton without a mordant, though the addition of alum will give a better colour. Pinks can be obtained by boiling red or green kangaroo paw leaves, blue peppermint gum leaves (*E cinerea*) or the flowers and leaves of Sturt's Desert Pea.

Dyeing with indigo

Indigo is produced from the indigo plant, *Indigophera tinctoria*, which grows wild in Queensland and the Northern Territory.

Method

Leave freshly picked leaves in warm water to ferment for 24 hours, simmer for half an hour, then add a little slaked lime and dip the cloth in the liquid. This may have to be repeated to get a deep colour, depending on the strength of the indigo.

Indigophera australis is a common ornamental native shrub with glowing sprays of bright purple flowers. The leaves give a very pale rather dingy dye when treated as above, though the quality appears to vary from plant to plant. Dyes from most lichens also don't need mordants, though they give a richer colour if one is used. The cloth should be simmered with the lichen for several hours. Colours range from yellow through browns and reds.

Brighter colours have traditionally been made from lichens by soaking them in urine or half strength household ammonia for about a month, then soaking the cloth in the resulting liquid. This method gives deeper reds and browns as well as blues. Some wood-rotting fungi can be used in the same way, giving various colours.

Woad is one of the most famous dyes, used by the ancient Britons to colour their skin. Woad *(Isatis tinctoria)* is a small pretty herb with masses of tiny yellow flowers in mid summer. It is available at many specialist nurseries.

To make dye from woad, strip off the leaves, pound them well, and store them in plastic bags till they start to ferment. Then simmer in a solution of quicklime and water. The quantities will depend on the growing conditions of the plant — you will need to experiment. Use just enough to cover the plant to start with.

Other dyes which don't need mordants include the common weed dandelion, which gives a pale pink colour; lady's bedstraw, a decorative herb which gives a pale rusty red; elder leaves and stalks which give a greyish blue colour; and coreopsis flowers which give a clear yellow colour if boiled with bleached wool or linen.

Dyes with mordants

The colours given below are only approximate. Both cultivars and growing conditions can vary, and so will the colour produced by any particular plant and mordant.

Eucalypts

It is worthwhile experimenting with any eucalypt that is convenient to you. Nearly all will give good colours with the right mordant, and most with any mordant or none at all.

Mahogany gum *(E botryiodes)*, with alum; fawn
Narrow leafed ironbark *(E creba)*, alum; fawn
Bastard Tallowood *(E planchiniana)*, copper and iron; black
Flooded gum *(E grandis)*, iron; black
Silver peppermint *(E risdonni)*, iron and copper; black
Red flowering gum *(E ficifolia)*, iron; black
Sugar gum *(E cladpocalyx)* alum; yellow
Apple box *(E bridgesiana)* alum; red
Blue peppermint *(E cinerea)*, alum; red
Red box *(E polyanthemos)*, alum; red
Mountain gum *(E Dalrympleana)*, alum; red
Red ironbark *(E sideroxylon)*, alum; orange
River red gum *(E camaldulensis)*, alum; orange
Victorian blue gum *(E bicostata)*, alum; orange
Brown stringybark *(E baxteri)*, copper; brown.

Other native dye plants

Native cherry leaves and stems *(Exocarpus cupressiformis)*, alum; light brown
Bauhina *(Bauhinia carroni)*, chrome; brownish yellow
Lemon scented bottlebrush *(Callistemon citrinus)*, chrome; gold
Brown boronia *(Boronia megastigma)*, alum; yellow
Banksia *(Banksia integrifolia)*, alum; gold
River she oak *(Casuarina cunninghamiana)*, copper; green.

Exotic dye plants

Horsetail *(Esquisetum)*, alum; grey
Onion skin, chrome; black to dark brown
alum; gold
alum and tin; bright yellow
Rhododendrons, chrome; various shades of brown
iron; pale to bright green
Tansy, chrome and cream of tartar; orange
Elder *(Sambuccus nigra)*, alum and salt; lavender to pale purple
Dandelion *(Taraxacum officinale)*, alum; reddish purple.

Dyeing cloth

There are many complicated procedures for home dyeing. The following is an extremely simplified procedure, however, it works. Take your dyeing materials and soak them in cold water overnight or longer. Barks should be soaked for about a month. Use soft or tank water if you have it. Use only enough water to cover the dyeing material — you want a very strong solution for dyeing.

Now boil the material for at least 45 minutes for petals, and one to two hours for leaves, depending on how tough they are. Leave for 24 hours and boil again. Strain thoroughly. Now soak your wool or cotton (synthetics won't dye) in the dyeing solution. Work to a general rule of a litre of dyeing solution for every 25 g of cloth.

Bring it all to simmering point. Take out the wool and add your mordant: say a level teaspoon for every 100 g of wool. Mix well. Replace the wool. Simmer for one to twenty four hours — the longer the simmering, the more intense the colour. *Never boil* — the colour may be destroyed.

Now either let the wool cool in the dyeing solution or take it out and rinse it in hot, then warm, then cool water.

If you enjoy dyeing there is no reason not to experiment with every plant in your garden, using changes of mordants and scraps of wool or other materials as testers.

Home dyed cloth will give you a subtler and wider range of colours than any commercial ones. And every time you look at them the greens and yellows and reds you produce may give you an echo of the plants they were derived from.

The quickest way to a slate floor

by Bob Rich

Healesville, Victoria.

THE quickest way to lay slate is to bond it directly to a freshly poured concrete slab. My friends Peter and Sandra did this some years ago. The results have lasted well. It is more usual to lay slate onto a well cured concrete surface using a sand-cement mortar. The total thickness of slate plus mortar is usually about 25 mm.

Laying slate on wet concrete is very much faster because you avoid the need to mix endless small batches of mortar, and eliminate the fiddly job of ensuring a level surface.

However, as always, there are costs, imposed by the need for speed. The last piece of slate must be laid before the concrete surface has gone off too far for adhesion. This requirement affects every aspect of the job. For example, the gaps between bits of slate must be filled with the sand-cement slurry on the concrete surface. If you want coloured grout, you must order colouring in the concrete.

The **workforce** you use must be skilled, able to work fast and accurately. If the job requires more than one truckful of concrete, you need two slatelayers in addition to the concreting team.

The **slab** must be exactly according to plans (preferably rectangular). Any irregularities mean that the end tile for each row must be cut to a different length. (This is done to measurement, before the pour. The shortened slate tiles then have to be numbered to ensure they go in the proper spots). Slab height must be set so that the thinnest slate tile will be embedded into the concrete surface by 5 mm.

Slate tiles must be exactly rectangular, perfectly uniform in size, and as uniform in thickness as possible. Also, each tile should be the largest a person can comfortably handle: the larger the units, the quicker the job.

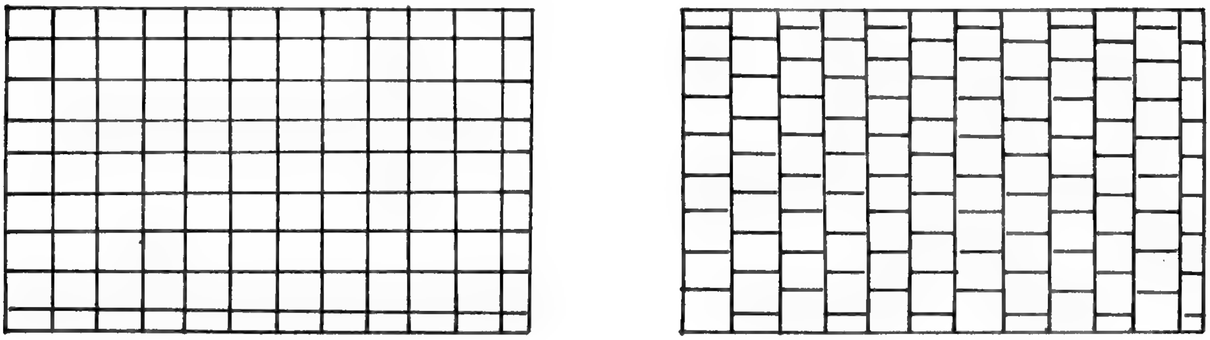
Design must be simple. Anything more complex than the patterns in Figure 1 is out of the question.

Preparation. As well as the usual jobs of setting up a slab (as described in the *Earth Garden Building Book*), there are a number of things to be done to prepare for slate laying.

First, you must have the exact locations of each wall and doorway. Of course, this is easy in an existing house — they are already there. If the walls are still a hope for the future, you must establish hurdles and stringlines. After the concrete has been screeded, the first thing will be to put these strings up, and scratch wall and door locations onto the surface.

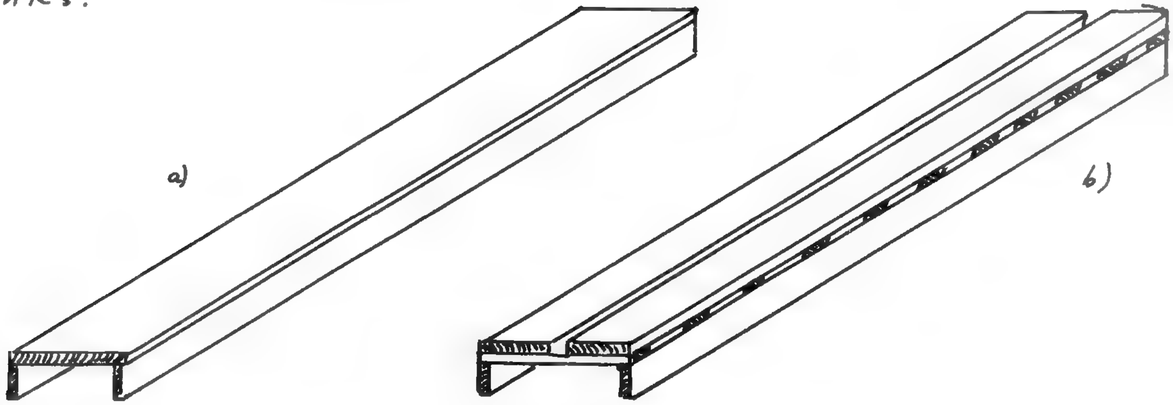
Second, you need to decide on gap size between tiles. Make these exactly uniform by using spacers: small wooden pegs of uniform thickness. Once you know the gap width, you can calculate the number of rows needed, the number of slate tiles per row, and the exact sizes to cut to at the ends (the need to cut may be avoidable by altering the gap size). Don't forget to allow a gap along each wall.

Third, there are two ways to get a floor not marred by cement stains. Either you seal the top of each tile at this stage, or clean the floor with an acid later. Pre-sealing is less work. It involves brushing on linseed oil thinned with turps.



Patterns which allow speedy laying.

Figure 2. Box beam bridges. b) can be wider, depends on several short cross-pieces under the planks.



Proportions depend on the density of the slate. For dense slate I use 3 parts turps to one part linseed oil, for porous slate a 50-50 mix. The oil fills the pores, so cement will be easy to scrub off with cold water.

Fourth, stack the right number of tiles conveniently to hand at each row, with the correct length offcut in the right place (top or bottom of stack, depending). These stacks must not be in the way of the concretors.

Finally, the slate layers need some equipment: a bridge, a straight edge to span the slab, and a shorter straight edge. The bridge could be a heavy plank set up on blocks at each end. It can be made both lighter and less bendy by constructing a box beam from three thin planks (see Figure 2). The long straight edge is like the concretors' screed. A separate one is needed if more than one truckload of concrete is involved.

On the day

Speed is essential on the day of the pour. Concrete should be placed to just the right height to minimise the need to shovel it around. You can hire a vibrator: a steel cylinder on the end of a flexible hose attached to a stationary engine. This, repeatedly dragged from one side to the other, rapidly moves the concrete to assume a level surface. After this, a single pass of the screed is enough. Alternately, do two passes with the screed. On the first pass, compact the slab as well as levelling it. As you saw the screed backwards and forwards, keep lifting it about 25 mm and dropping it. This brings plenty of the sand-cement slurry to the surface.

The two slate layers swing into action as soon as a suitable section is level and smooth. First, if necessary, they mark in walls and doorways by temporarily stretching the relevant stringlines and transferring the locations to the surface. They then put their bridge in place, lay a row, level it, move the bridge, lay the next row, level it, and so on until the last tile is down.

Laying a tile

One person does the slate laying, the other is the "gofer". The layer (it's rude to call them a "slater") places the three spacer pegs to set the gaps to the correct width (see Figure 3). The gofer passes over the next tile, ensuring that the pattern is followed. It is a good idea to paint the bottom surface of each tile with Bondcrete, especially for tiles which are thin, or have a smooth surface. If this is done, it's the gofer's job at this stage.

The layer puts the tile in position, hard against the spacer pegs, and pushes it down into the concrete with a wiggle (of the slate, not the layer!). Skill is involved in this: the tile must be pushed down well enough to make the concrete mould itself exactly to the underside of the tile. However, a tile pushed too far may have to stay that way and spoil the floor, while too high is easily correctable. When the tile looks right the spacer pegs are pulled out and repositioned, and the squeezed out cement slurry should be wiped off.

Levelling a row

The time to level a row is as soon as all the tiles in it are down. A straight edge spanning the slab is placed along the centre of the row and given firm taps with a heavy hammer (or a booted foot) over any bits that stick up. This tends to force the previous row to ride up, so the long straight edge is moved out of the way, and a shorter straight edge (about the width of three rows) and a spirit level are used to check spots which look high. The straight edge is placed at right angles to the rows with the spirit level on top. A few taps on top of the straight edge — with the spirit level removed first — should straighten the surface.

Afterwards

Cement stains should be removed from the slate as soon as the slab is firm enough to bear weight. If the slate has

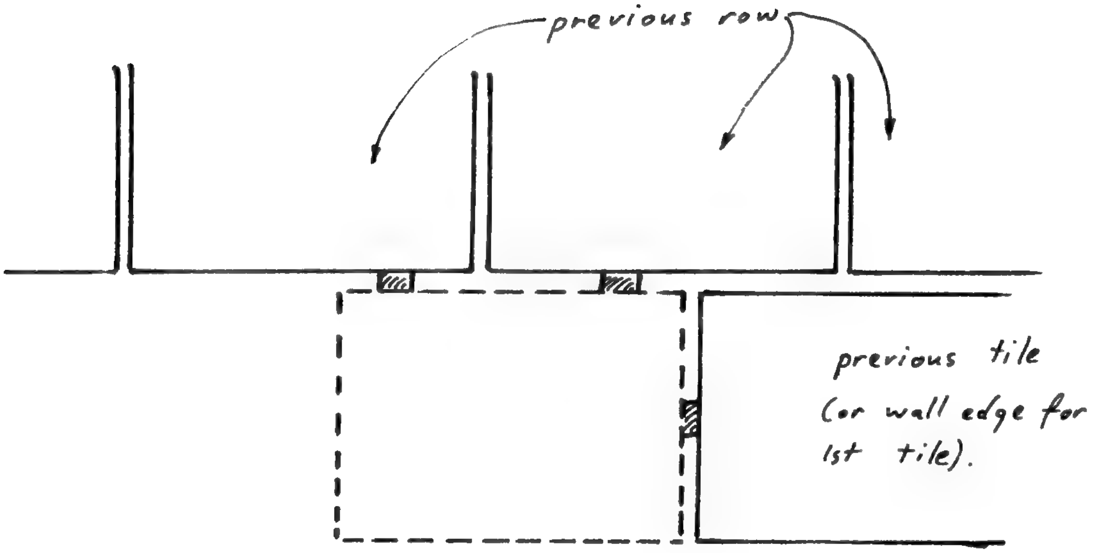


Figure 3. Using 3 spacer pegs to get uniform gaps.

been pre-sealed, this is a matter of cold water and a scrubbing brush. A flat-bladed knife is a big help. Hose off the resulting muck. The alternative to a hose is a floor mop, and two buckets of water (wipe a stretch, rinse mop in the dirty water, rinse in clean water — replace the buckets often).

Unsealed slate needs to be cleaned with acid. Dilute hydrochloric acid is the usual stuff. I have used sulphuric acid from a dead battery with good results. Dilute about 1:10 with clean water. Brush on the tiles (avoiding gaps), leave for half an hour or more, scrub, then neutralise with bicarb soda solution before rinsing off. Wear gloves. Do the job in strips with walking spaces in between. The result is definitely not a work of art, but if you want a slate floor with minimum effort and time, this is the way to do it.

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— A garden full of birdlife —

by Muriel Courtenay

Port Bundaberg, Queensland.

HOW many kinds of birds can you find in an Australian suburban garden? (With apologies to Percy Grainger). Each year on Australia Day, the Australian Wildlife Preservation Society conducts a bird count in urban areas. Volunteers are asked to sit in their gardens from 7.00 to 8.00 am and record the species sighted on the property or flying over.

While the count is mainly to determine the effects of introduced species on native birds, the results show that many bush species have adapted to living in a suburban environment.

It doesn't take much to lure birds to your garden — a few table scraps, a bird bath and, most importantly, trees. Plant the kind that provide nuts and nectar for our feathered friends.

If you have a dog or cat it will be harder to attract the birds unless the animals are very docile. Cats, no matter how well fed, have the instinct to stalk birds. Some dogs will take little notice of them though few pass up a chance to chase magpies who will pinch their food given half a chance! Bolder species can co-exist quite happily with other pets.

Our suburban allotment was bare grass but in the midst of canefields and quite a bit of open country. An enthusiastic tree planting programme coupled with rich soil and a sub tropical climate have greened our piece of Australia and brought new friends into our life.

No Aussie home is complete without a magpie carolling at dawn. Our magpies take it a step further. They sit on the verandah table for their morning chorus putting on the pressure melodiously until we throw them some breakfast. As someone said, they've got us trained. They warble, and we run out with the scraps.

Two adult birds and three juveniles make up the family. Happily the youngsters are past the food squawking stage. Their constant cries and wing fluttering used to drive us up the wall, let alone their harassed parents.

They spend most of the day in our garden. During the hottest hours you'll find them in the dense shade of the white cedar sleeping with one leg tucked up or softly singing to themselves. One youngster is bullied unmercifully by his peers but rather than fight, he throws himself on his back, knobbly legs sticking up in the air, in a gesture of complete surrender.

The magpies have become very possessive of the territory and will zoom in with snapping beaks to strafe the top knot pigeons grazing on the lawn. They scatter in panic stricken flight, their wings making the distinctive high pitched whirr.

The pigeons' plumage is immaculate — soft grey tinged with red, while darker feathers make up their topknot. The handsome males court the females with soft clucks and bows, wings and tails outspread. This prancing and cavorting is even more spectacular when performed on the power lines, a great tightrope walking act.

A regular visitor is the grey butcher bird who trills loudly to advertise his presence. If ignored he lands on the window sill and taps the glass with his beak. Only for the screens, he'd be inside. This little friend will accept titbits from our hand. Butch makes full use of the bird bath and enjoys several dips a day. He stands in the shallow bowl wallowing and throwing up water with his wings, then flies to a branch to shake himself and preen.

Bird baths are a big attraction for all species. They need to be set up near leafy trees with solid branches for the after-dip preening. Smaller birds are wary of being attacked in this situation and need a bolt hole with good cover. The bath itself should be firm and fairly shallow. Don't expect instant success, it may take a while before the birds will use it.

Honeyeaters enjoy a swim — from the large brown ones who bathe enthusiastically to a tiny yellow breasted fellow who barely makes a ripple with his lightning dives. Willy wagtails take the plunge with enthusiastic whistles.

Grevillias, wattles, bottlebrushes and flowering gums supply nectar for the parrots and honeyeaters. They are never happier than hanging upside down sipping from the crimson bottlebrush flowers. A golden grevillia which blooms profusely all year is a favourite with blue cheeked honeyeaters, drab grey ones with harsh scolding voices and tiny flitting types with melodious calls.

The rosellas come to plunder the wattle blooms in the early morning when they are rich in nectar, and later to eat the seeds in the wattle pods. Their favourite tree is a swamp bloodwood with beautiful deep pink blossoms. They perch daintily on the fat pink buds, beaks buried in the open flowers crooning with approval. One day as I passed the tree it exploded into green fragments as tiny scaly-breasted lorikeets took flight.

Summer brings the pale headed rosellas, resplendent in vivid blue and gold plumage, to graze on the lawn. The nuts of the casuarina tree are held in one claw while they extract the seeds with dainty nibbles.

The hot months are also time for the nesting rainbow birds to dig their small burrow in the footpath bank. From an electricity pole nearby, they keep guard checking for enemies before dropping swiftly to the ground into the small entrance hole.

At the start of the wet season, the haunting cry of the koel cuckoo or 'stormbird' echoes around the neighbourhood as he calls for a mate. Only rarely do we see this blue black glossy creature with his long tail. His rain predictions should be taken with a grain of salt. An even rarer sighting is the pheasant whose glug-glug-glug is sometimes heard.

Rain brings the martens to the garden where they dive and swoop collecting insects, cheekily buzzing any humans in their path. The lorikeets use the wet tree leaves to shower, shrieking with delight as they shake raindrops over their feathers.

The large tidal river nearby attracts estuary birds to the area. We're on a pelican flight path as they take a short cut from the river to the boat harbour. One night I counted 30 flying over in majestic convoy. On windy days they circle high above, riding the thermals.

Plovers have taken over the small river park opposite, defending it with strident calls and aggressive behaviour. They nest in paddocks away from the river and when the young birds are mobile, walk them to the river — night and morning — to feed on the grass and mud flats. This journey includes crossing a busy road with Dad in front leading the way and Mum bringing up the rear shepherding three youngsters. One chick is always keen to do his own thing and won't keep up. He is herded back into line with sharp reprimands. My heart is often in my mouth while they cross the road but despite a few near misses, they have survived.

Another day we saw a duck with ten ducklings heading for the river. This well disciplined bunch followed in tight formation astern. The mother paused often, taking cover in long grass, disappearing completely from view. Not a cheep was uttered. After a few minutes her head would rise slowly like a periscope to survey the scene to see if it was safe to continue the journey.

From our window, I see the red back kites wheeling over the river and one lands on a post with a fish dinner clutched in his talons. A harsh indignant cry tells me the white heron is flying back to her nest on a vacant allotment. Spoonbills, gulls and terns comb the riverbank while flocks of ibis and egrets fly inland to the swamps which are rich in food.

A low chuckle announces the arrival of a kookaburra whose favourite perch is theclothes line. Even when it is full of clothes and whirling around, he rides along keeping balance by sharp tail movements. A full throated chorus is the signal that he is on top of the power pole, often with a small snake or lizard which disappears in a series of gulps.

One year we had an explosion of mudlarks. They were in plague proportion taking over the garden but Nature has restored the balance again and only one or two remain to peck at their images in the hub caps of the car.

A garden, a good bird book, binoculars and time to observe will provide entertainment, information and interest. Our feathered friends have given us hours of enjoyment.

Self-sufficiency, Depression-style

by Gwen Laker

Holt, ACT.

I SPENT several years on my father's farm during the Depression. It was out west in an area that had recently been opened up. There was no phone, electricity or running water on the property and as a city girl I found it extremely hard to adjust.

There were dams, but more often than not they were dry due to constant droughts. When not, we had to clear the muddy water with lumps of alum. This made the water bitter to taste and when used with soap, it curdled. We used cloudy ammonia to prevent this and to soften the water.

The property was in a sheep raising area so we killed our own meat. There was no refrigeration so what we didn't use immediately, we half cooked, then pickled in a strong brine of salt, saltpetre and water. Today's doctors would throw up their hands at such a salty diet, but as we couldn't afford to go to the doctor, it didn't really matter.

The fat from the mutton was rendered down, then clarified by boiling it up with water. The impurities would be on the bottom of the fat when it set. When this was skimmed off, we made the fat into soap by adding water, caustic soda and a few drops of eucalyptus oil. Unfortunately, I don't have the correct quantities of the ingredients.

For a change in diet we ate rabbits. There were thousands of them and my brothers used to trap them for their skins. When the meat was casseroled with onions and artichokes it was both nourishing and tasty.

A neighbour gave us a little black pig. My brothers had a weird sense of humour — they christened him Lucky. Poor Lucky met his maker one Christmas: we ate him.

Eggs were plentiful, so we sold a lot to the local storekeeper for four pence a dozen, and what we didn't eat ourselves, we preserved. During the Depression, nothing became obsolete. Even the sugar bags, which we made from Hessian, had a use. After they'd been opened out and boiled with the homemade soap to soften them, they were edged with floral cretonne and made into hand towels or aprons.

One woman I knew had all her underwear made from the calico flour bags. But the brand couldn't be washed out. I can't imagine anything more demoralising than having "Snowdrop Flour" stamped on the seat of your knickers.

We bought golden syrup by the seven pound tin, and made jam from the pie melons that grew wild in the paddocks. Everybody did their own shoe or boot repairs — a boot last (a model for shaping the shoe) was a necessity. Although raven oil was only to be had in black or brown, it became a must for scuffed heels or toes.

Before we were married, my husband got a job as a farm hand. He was paid twenty five shillings a week and his keep, excluding clothes of course. It took him six months to save enough to buy me an engagement ring, which we bought through a mail order catalogue. In the first year of our married life, we ate an awful lot of flapjacks — a scone-like mixture which was fried in hot fat. They were delicious spread with golden syrup and eaten hot.

When my first child was born, it was more difficult. Necessity ruled that he be fed on cow's milk. To prevent it from going sour it had to be boiled, strained, put into a jug that was covered with a piece of wet muslin, then stood in a basin of cold water. The whole lot was then placed in the cool safe, a box-like frame covered in Hessian with a tin tray top and bottom. The top tray was filled with water into which rags or pieces of flannel had been placed to drip down the sides into the bottom tray. The bottom tray had a small top in it so that it could be emptied when full. It was a primitive mode of refrigeration, but it worked and the child survived.

We had a cow so it was natural for us to make our own butter. First we heated the milk in a big preserving pan on top of the stove. When a skin formed on top of the milk, we removed it, allowed it to cool, and placed it in the cool safe. Next morning, we'd skim the thick layer of cream that had risen to the top of the milk. This was what we called clotted cream. It was delicious on a piece of bread and jam or a pudding. The rest we placed in a crockery basin and beat up with a large wooden spoon. Within 20 minutes we'd have butter. This would have to be washed several times with cold water, then a small amount of salt added. It would then be shaped into the required size with two wooden butter pats, and the finished product wrapped in greaseproof paper. The buttermilk or whey which had separated from the butter when churning was usually fed to the poddy calf along with the rest of the skim milk.

No one could accuse us of polluting the atmosphere or poisoning the soil. Plastics were unavailable and if there were pressure paks, we wouldn't have been able to buy them. The only fertilisers used were the natural waste products from the fowls and animals. All paper was salvaged: some to be cut up into little squares to serve as toilet paper and the rest as an underlay for floor coverings. We even had one room papered with *The Herald*.

The chooks and dogs cleaned up any table scraps and the smaller bones were chopped up to be used in the bottom of the tins in which I grew plants. A rubbish dump was hardly necessary.

Times were indeed hard, but in retrospect, we caused little damage to the environment. Perhaps another Depression wouldn't be such a bad thing in some ways. Goods would have to be recycled. It would be a case of survival at all costs. A throw-away society would be a thing of the past.

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Ferment in the kitchen

by Steve Fitzgerald

Upper Mongogarie, New South Wales.

WE USE home brew quite a bit in cooking. Beer can be used to thin down sauces of course, and it's surprising how much can be used in the kitchen, especially when a few helpful friends gather around the stove. Home brew makes good sense for the following reasons:

It's a lot cheaper than commercial brews.

You use your own water and control the amount of chemical used in your beer.

Only a small weight is transported to the shop and home, thus using resources more efficiently.

You recycle the bottles yourself and don't have to dispose of them.

The companies that sell this gear are relatively small Australian concerns, not the 'big boys'.

It is a useful trade item. Sometimes a neighbour or local may do you a favour, and whereas they would not possibly accept money, a bottle or two of best home brew is often happily received.

Of course, there's also the satisfaction of making it yourself.

I started experimenting with beer when our dairy cows were dried up once. Having become used to a steady stream of milk always available, and having a constant supply of eggs, the problem was how to make quiches, pancakes and many of the other things we cooked using milk and eggs without the milk?

Well now, a bit of home brew never seems to go astray I told myself. Why not try some in a quiche? At worst we could eat cheese on toast. Lo and behold — it works, simply substitute the same amount of beer for the milk you would otherwise use. The same goes for pancakes and omelettes — home brew seems to make the pancakes a little crisper than when they are made with milk. Beer can also be used to make a light batter, this is a traditional method in Japanese cooking.

In fact, any sort of custard mixture seems to work fine with beer instead of milk. This might be useful for people with a lactose intolerance. Alcohol in the beer is removed by boiling during the cooking process. I'm not knocking milk, of course — it's good stuff and can be used in many ways. For some extra good milk recipes and a good read, I can recommend *The Healthy House Cow* which is available through Earth Garden. Pardon the plug, but I'm biased.

Beer also goes well in pizza. To make up some pie base mixture see EG 65 for the recipe or make up a scone dough — even a pizza dough if you want to be fancy. Line an oiled pie dish with this mixture, spreading it up the sides.

For the sauce:

1 onion
half a jar tomato paste, or catsup, or 6 large fresh tomatoes
half to two thirds of a bottle of beer
1 big pinch of sunflower seeds
handful of basil
garlic to taste
pepper or chilli
salt or tamari if used
1 cup chopped garden vegetables
suitable herbs (eg oregano, dill, bay leaf).

Chop and fry the onions till soft. Add sunflower seeds, and stir fry until the onions start to brown. Fry the vegetables lightly with the onion. Add chilli and tamari, and stir to coat the contents of the pan. Spoon in the tomato paste. If you're using fresh tomatoes, fry them until they're softened and reduced. Add bay leaves, if you're using them.

Pour in the beer, and vary the amount according to how sloppy you like the sauce. Put the lid on the frying pan and simmer for ten minutes. Finely chop the garlic, herbs and basil and add to the sauce. Reserve some basil for sprinkling on the top. Let the sauce cool for five or ten minutes and remove the bay leaves.

Pour the sauce into the pie shell, top with grated cheese and, if wished, continental sausage (for example pepperoni) or finely diced bacon, and bake in a 350°F oven for 40 minutes.

String

Another of our favourites is 'String'. That's what we call it, but actually they're bean noodles, made from the starch of mung beans. Packets of these are available in Asian and health food stores. The instructions on the packet say to soak the noodles in very hot water for ten minutes — alright but rather bland. Here is my way:

Make an omelette using
2 or 3 eggs
one tablespoon sesame seeds
dash milk or beer.

Whip up the mixture and fry it in a hot oiled pan, remove and keep warm.

For the meal proper:

1 onion
2 tablespoons sunflower seeds
1 cup chopped garden vegetables (beans, squash, egg plant etc)
two thirds to one bottle of home brew
fresh tomatoes, or tomato paste if desired

fresh ginger to taste
garlic to taste, chopped
chilli sauce
salt or tamari
third of a cup of sprouts (preferably not bean)
4 oz bean threads (about half a packet).

Chop and fry the onion in the oil left in the pan from the omelette. Add the sunflower seeds and quickly fry. Stir fry the vegetables. Finely chop the ginger and add it to the pan with chilli and tamari, stirring to coat the vegetables.

Stir in the tomato paste, or tomatoes. Add the beer and finely chopped garlic. Add the bean noodles and mix till they are softened. Put the lid on the pan and simmer for ten minutes, checking to see the mixture doesn't get too dry. Chop the omelette, and stir it and the sprouts (if used) through the sauce. Serve on warmed plates, top with finely chopped parsley and chives and a nasturtium flower if available.

This recipe can be easily varied in many more ways. For example, the dish can be topped with cheese, diced cooked meat could be added, stout or wine make interesting substitutes for the beer, cream can be added at the last moment, orange and/or lemon juice can be used as some or all of the liquid, and mushrooms may be included.

'String' also has the enviable quality of being cooked entirely in one pan, thus reducing washing up — perhaps the least fun part of much creative cookery.

These sauces are also good with spaghetti, macaroni and other pasta products or with rice. Beer also forms an excellent gravy. I'm going to cook a pot roast tonight, and here is what I'll do:

Pot Roast

1 rolled rib roast
herbs to taste (sage, savoury, thyme)
garlic to taste
chilli and tamari to taste
one third of a bottle of home brew.

Slit the meat and insert slivers of garlic and pinches of finely chopped herbs. Let it stand for at least two hours, if possible. Add no fat to the pot, fry and seal the roast starting on the fatty edge so some fat will be released. Splash in a little beer if it gets too dry.

Add the chilli sauce and tamari to the pot, turn to coat the meat. Pour in the beer and put the lid on the pot. Simmer in the oven for two and a half hours, removing the lid for the

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last 45 minutes. When the meat is cooked, slice onto warm plates. Tip off and save the excess cooking liquid. Reduce the remaining cooking liquid to a gravy and pour it over the meat (I'm getting hungry).

The remaining cooking liquid will turn into a jelly like consistency in the fridge, the fat will solidify on top and is easily removed. This jelly makes an excellent stock, or can be thinned slightly with beer to make a marinade. Straight beer is also an excellent marinade for meat and fish, although lemon wine is my favourite for our finny friends.

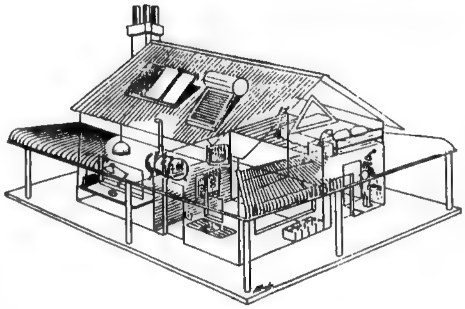
Beer can also be used in non-fat cooking. Instead of adding oil to the frying pan when you are going to cook something in a sauce, pour a little brew into the pan and cook the onions, and whatever else, in this. When roasting meats, there is no need to add oil to the baking pan, unless you want to cook crispy potatoes in the same dish. For a roast such as leg of lamb, pour a quarter to half an inch of beer into the baking dish and sit the roast in this — the beer will make basting liquid and the gravy as well.

The same principle applies to smaller things like lamb shanks or spare-ribs. I use a small baking dish, just big enough to fit the meat in, and fill it with beer about half way up the meat I want to roast.

Another excellent use for beer is to rinse out jars: tomato paste, horseradish, mustard, chilli, and all those things that are savoury and can be used in a sauce, even peanut butter. When you've spooned as much from the jar as you can, rinse the jars with home brew.

A good shake gets every bit out so you can pour it into your cooking. This method even works on those rotten 'Mastercraft' jars that seem designed to prevent total removal of the contents, even using your fingers to wipe them out.

Oh yes, home brewed beer makes good drinking too.



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Our Cubby House

by Christine Kees

Yangan, Queensland.

FOUR years ago our family decided to go bush. Myself, husband and three children under five began the hunt for the perfect spot. We used a map of Australia to find a spot and eventually found our mountain block in upper Emuvale. It has plenty of trees, hills and a fresh mountain creek running right along the property edge. So we bought it.

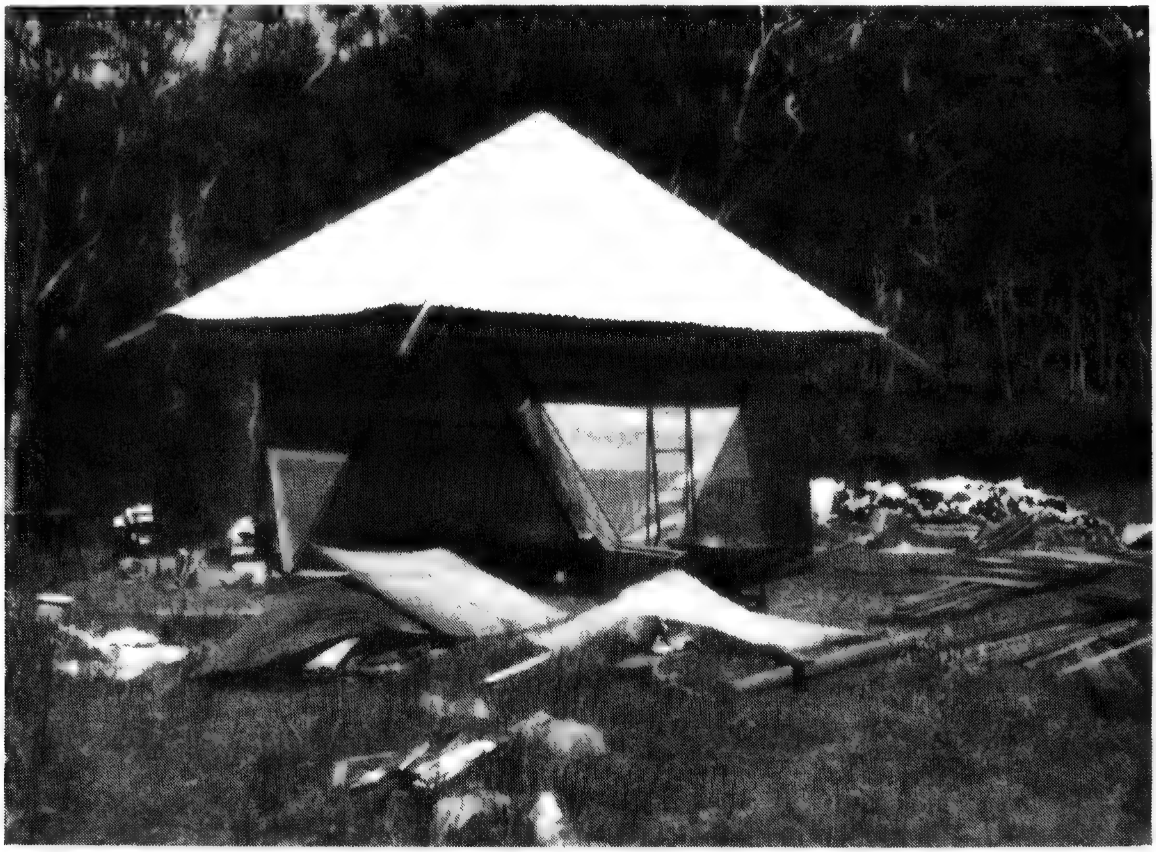
Then came the packing up and moving. We bought a 20 foot tent and left. At first we were very busy getting settled in but we started to run out of finance fast (there was no work in the area). So we left and found jobs in Brisbane and saved and built up the things we needed. We then decided to move closer to the land so it was time to pack up again and we moved to Toowoomba.

By this time we were searching for a low cost building that could be erected quickly as a temporary home on our land. We decided to build a dome shaped house. My husband designed and sketched for days. Our backyard became a mess of building materials but we were lucky to get a small old house for $150 which provided many building parts. We started to build — the kids kept asking Daddy what it was, he called it a cubby house, and the name stuck.

We erected it in our backyard, so it became like a kit which we could reassemble on our land. We took it to pieces, marking every piece, loaded it onto the truck and headed for our block.

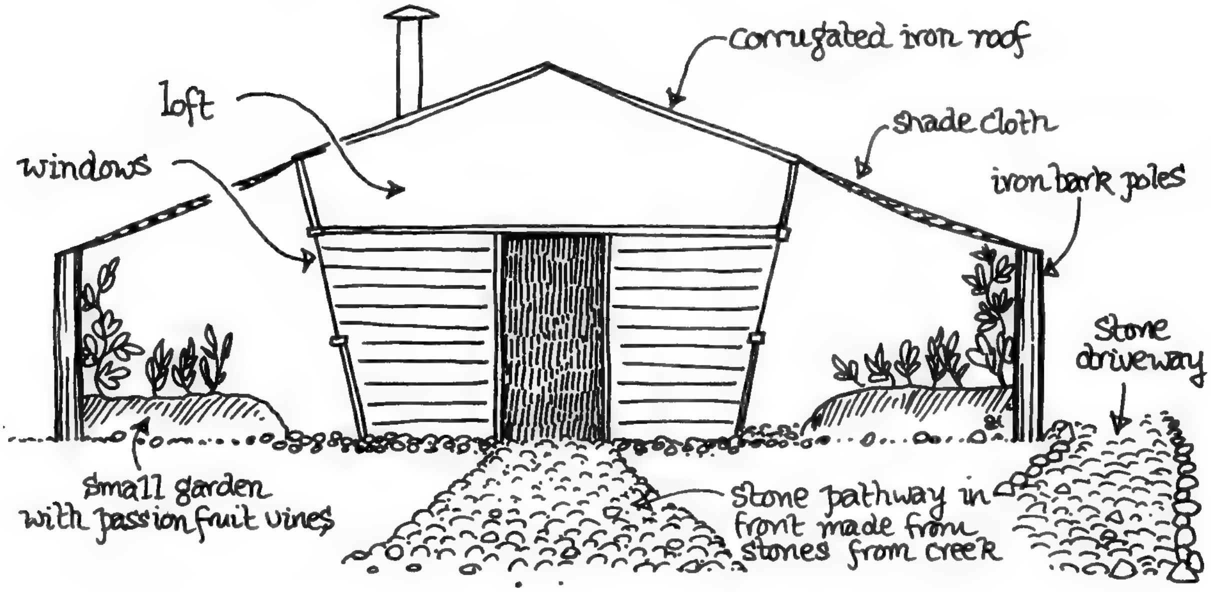
The dome cost us around $500 to complete and took about two weeks to make habitable. The frame and top floor are timber and we have a corrugated iron roof with a concrete floor. The walls are made of solar weave (the white plastic on some greenhouses), which we nailed on over the frame. It allows in a good amount of light, summer and winter, and is very warm during winter days.

We've hung green shadecloth around the outside so it looks like a verandah and we've collected small stones from our creek and laid them all around the cubby house for pathways. We've also put up stone walls and garden beds to make it look attractive. We planted trees around the house, including an orchard and passionfruit vines. It took us about six months to get to this stage. Now it's very comfortable inside our little house. We have a loft where the family



The Kees cubby house in the process of being built. It took one week of work to get this far.

• OUR DOME-SHAPED HOME •


corrugated iron roof
loft
shade cloth
windows
iron bark poles
Stone driveway
small garden with passionfruit vines
Stone pathway in front made from stones from creek

The cubby house is 16 ft. square and 16 ft. high in the centre, sloping down to 8ft. under the second floor.

sleeps (five) and downstairs is our living area.

Our toilet is 'different'. We found an old watertank, tipped it on its side and put a wooden box in it with a bucket and seat — it has the most beautiful view of our property.

It's taken a lot of time and very hard work to get this far but it's all been worth it. To have a piece of paradise to call your own is one of the most wonderful feelings. I hope this will encourage others to make the same move as us. Don't be afraid because when you get this far you can't turn back no matter how hard you try.

Inside our little house we have an old wood-burning heater which heats the dome nicely in the winter as we have temperatures here below zero. At the moment we're trying to build and complete our bathroom. We are really looking forward to a bath, as the creek is very cold in the winter, especially for the kids.

The bathroom will serve as a wash house also, so things are starting to look up. We will put a small wood burning stove in the bathroom that will warm the room as well as heat the water for the bath. We've bought a claw foot bath because they're easier to install and look beautiful when they are done up properly.

We hope we'll be almost there by the end of this year — only to start again on building our big house. But for now we have our cubby house. We don't have electricity and are not likely to, but a small two and a half Kv generator runs everything we need.

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FROST FREE GARDENS

by Jackie French

Braidwood, New South Wales.

FROST damage isn't inevitable. If you don't get frost in your house there's no reason why you need have it in your garden either, but in most cases it's simply not worthwhile managing your garden to that extent.

There are a number of things you can do however, to reduce your frost problems. Some are simple, some a lot of work, and the more complex ones can be expensive. It's up to you to decide how much trouble you're prepared to go to in minimising frost in your garden.

Choosing a frost free site

The best frost prevention is choosing the most frost free site. Even in a small garden susceptibility to frost can vary enormously. Imagine frost as a body of cold air flowing like water. It will settle in dips, flow down gullies and watercourses, and be easily blocked by fences and other plants. If frost can drain away it may leave high spots clear, especially if they are north facing and so, warmer.

My garden is on a slight slope with a ridge behind it. Even in this small area there are enough differences in microclimate for me to grow cherries at one end, where the frost stays till midday, and have avocados fruiting at the other.

Remember too that the worst frost damage occurs when plants thaw rapidly. I get nearly as much frost as a friend on the tableland above me — but he gets much more frost damage, because direct sunlight hits his crops at least two hours before it reaches mine every morning. His plants thaw quickly and are damaged, whereas mine have a chance to thaw slowly before the first rays of the sun touch them.

It's worthwhile sometimes covering frosted plants with newspapers or sacks in the early morning so they thaw more slowly (see repairing frost damage). A north west facing slope will warm up more gradually than one facing north east.

It's also a good idea to watch an area for a winter to see how frost patterns fall before you do major plantings. You need to work out if your intended garden design will change the frost pattern. For example a new fence might block the frost and burn off plants previously untouched, while clearing a hedge could let frost drain away. The slow growth of a large tree may gradually protect the plants beneath it.

Making a frost free site

If you are on a slope clear away any blockages if you can. Weed piles, fences or even long grass or bracken around the fences can prevent the frost draining away. If you have a hedge that you don't want to remove, try cutting low drainage holes in it.

Mulch can make a considerable difference to frost, by keeping the soil, and the air just above it, warmer. Dark mulches work best, as more heat is absorbed during the day. Mulches that trap most air, like hay, are also good: dark semi-rotted hay is excellent.

Having your garden mulched will of course mean that it takes longer to warm up as well as cool down, but it should be warmer when you need it, in the frosty hours of the early morning.

Cover your plants on nights when a frost is likely. Make a guard of old fencing wire or tomato stakes and cover with sacking, plastic or whatever is on hand.

Frosts can usually be predicted by gazing at the sky at night. If the stars are particularly bright and twinkling there will probably be a frost. Frosts are less likely on cloudy or windy nights unless the cloud clears in the early morning.

It's worth keeping frost records from year to year. In most areas the dates of the first and last frost each year are fairly consistent. It's helpful to know, for example, that last year your first frost came in early May and your last at the end of August.

An old orchardist's trick is to light fires between trees. The smoke from the fires is actually more useful than the heat from the flames. Orchardists used to use specially designed braziers that burnt all night with a lot of smoke. Try covering a good bed of coals with green wood instead.

In very cold areas snow can actually act as an insulator, and will do less harm than the frost. Don't clear it away from your garden, heap it up instead.

A weekly spray of seaweed or nettle tea is said to increase plants' resistance to frost. Either spray can be homemade: just cover with water and dilute to the colour of weak tea when needed.

Overhead irrigation helps protect frosts by releasing the latent heat of the water during spraying. For this to be effective in helping your crops you must start spraying when the temperature is still at least 2° C or more. You don't necessarily need large scale commercial equipment for this. A garden spray or even microjets can also work well.

Wind machines are used commercially to mix cold air with the warmer air above it. (Remember when dealing with frost: cold air sinks, warm air rises.) These are available commercially, or can be made at home. A ten horse power motor driving a propeller on a ten metre tower is claimed to raise the temperature over a hectare by 2° C in a few minutes.

Some frost prevention gardens

The covered garden

Circle, and then cover the garden with wire mesh so only the tops of the plants show through. The mesh should stop the leaves blowing away. Part the leaves to harvest crops through winter. Be warned, however, your plants can get very dry under this mulch, won't grow much and can eventually rot. This trick is best kept for about six weeks in late autumn or early spring for late harvesting or hardening off early plants.

The moated garden

Dig a moat around your garden, or a pond in the middle of it. Anyone who has watched steam rising from a lake or river in the early morning can imagine the heat sink effect of bodies of water.

The sheltered garden

Orange groves in England used to be planted in specially designed groves of other trees, tall and thick, that kept them sheltered, much like the walls of a house, and protected from cold winds. However, if this means planting it on the down-slope of your garden it's probably not worth it unless you can include frost drainage channels in your design.

The high garden

Gather up old tyres, and pile them high: as high as you need to get your plants out of the reach of frost. If this means a pile of more than three tyres drive a stake down the middle so they don't fall over. Now fill them with earth, compost, or old hay or manure. If the material is still decomposing this will give a bit of added warmth, although it isn't essential. Plant your crops up top — even fruit trees work with this method, as long as the whole setup is well staked till the roots grow down below the level of the tyres. Water well because drainage is excellent in tyre gardens.

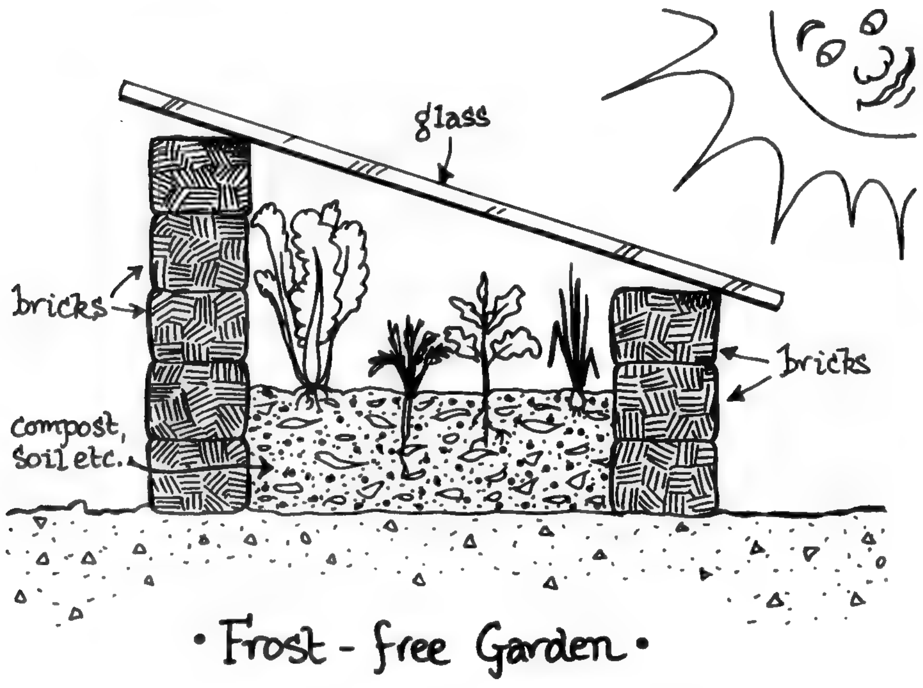
You can of course build up your aboveground frost free garden from materials other than old tyres, but these are easy to come by, and because they are thick and black they absorb and retain heat well.

The flooded garden

An emergency method of keeping frost from your crops is to flood them. This is easy in a garden with waterproof (concrete or mortared stone) permanent edges. Otherwise edge the garden with boards, making sure the ends butt firmly.

Now line the garden with newspaper, at least 6 pages thick, making sure that the pages overlap and rise up to the top of the boards. Just before you go to bed, on any clear starry night that seems to smell of frost, fill the bed with water, as deep as possible. Leave the hose just dripping into it.

Take the boards away in the morning to drain away the water. As long as you drain the water in the morning you can use this method even with plants that are susceptible to collar rot, especially if you give them their own collars of newspaper to stop soil-borne spores from infecting them.



• Frost - free Garden •

The manure heated pit garden

Dig a hole about 60 cm deep, pile in leaves or still decomposing manure. Cover with sandy soil. Plant your vegetables. Now lay a few stakes over the pit and balance old windows or clear plastic on a few bricks so they are oriented to the morning sun.

These beds can also be used to help strike cuttings needing bottom heat or to get early seedlings for spring planting. The heat generated by the decomposing material should mean that this pit cold frame is relatively frost free.

Formal aboveground heated frost frame

Make a manure or compost pile about 60 cm high. Lightly cover it with soil. Carefully fit a cold frame over the top of it, so the top is level with the top of the pile and the main slope is oriented to the morning sun. A good mix for the compost pile is equal parts of coarse leaves (not gum leaves) and fresh cow or horse manure. This mixture produces a good, long lasting heat, but experiment with any compostable material on hand.

Wait about a week before planting out the cold frame to give the bed a chance to warm up evenly (see diagram on previous page).

Repairing frost damage

Remember it isn't the freezing that injures the plants as much as the thawing, as the frozen cells expand and burst. There are two ways to limit this. Firstly cover your plants before the sun hits them, either early in the morning or any night you expect a frost. Try a hessian sack on stakes, or a loose sprinkling of hay all but covering the plant. Remove the cover once the plant has warmed up, say about midday. Or give your plants a thorough gentle watering before the sun hits them. This way the plant cells gradually relax instead of bursting. Even totally frozen plants can be restored this way, but it does probably mean getting frozen yourself, leaping out of bed in the still dim hours of the morning.

As a last resort, of course, rely on frost hardy plants and ones that have been hardened to your area, not forced in a greenhouse and smothered in a heated supermarket or garden centre. You can harden your plants gradually by leaving them outside for longer and longer periods each day.

Frost resistant vegetables include broccoli, cabbage, cauliflower, carrots, parsnips, brussel sprouts, onions, spring onions, silverbeet, spinach, Chinese cabbage, kohl rabi, chicory, leeks, celery, beetroot, winter radishes, turnips, foliage turnips, peas and broad beans (if not flowering), sorrel, winter lettuce, salsify, seakale, shallots, New Zealand spinach, and, to a limited extent, potatoes.

Especially frost resistant fruit includes rhubarb, currants, gooseberries, cold climate blueberries, medlars, cranberries, quinces, loganberries, mulberries, crab apples, damson plums especially, and other plums to a limited extent, hazelnuts, chestnuts, walnuts and apples. Many other sorts of fruit will take heavy winter frost, but late spring frosts can prevent fruit set. Try overhead spraying or smoke techniques, seaweed or nettle sprays or high mulching.

With practice you can learn to literally 'smell' a frost: it's a sharp, clear, almost sweet smell. Once you've learnt to know the portents you can judge for yourself how much effort you're prepared to put into protecting your crop.

A successful winter garden

by Robin Jean

Braidwood, New South Wales.

ON THE Tablelands where I live, the vegetable garden tends to shut up shop in winter. Frost tender plants such as tomatoes and beans are annihilated in the first heavy frost. The first frosts usually are heavy so we can lose these plants early in autumn. However, it is not only these plants that are affected.

Although in theory carrots, parsnips, celery, cabbages and others are not frost tender they do not react well to continued -6°C and in their weakened state the stems may become brown and mushy. This does not matter for root vegetables but it is catastrophic for celery and parsley. Also, the vegetables just stop growing. So if you didn't get them to an edible size before the onset of the cold weather, then you'll probably never harvest them. With the warmer weather in spring they'll shoot and go to seed.

So how do you produce enough vegetables for year round consumption in our colder areas? Some people we know grow morein summer and then live from the freezer in winter. We can't do this because we have limited solar refrigeration and freezing space. We have enough trouble coping with meat preservation without trying to include six months worth of vegetables in there too.

We grow some vegetables to store: potatoes in a bag in the shed and tomatoes in bottles in the storeroom. Carrots, parsnips and onions will sit in the ground all winter. Cabbages with a heart will sit there too as long as they don't get too much water, in which case they'll split and rot. But there are still those vegetables which are not easy to store and though they are not frost tender, do go brown and mushy in that extra cold. Also there are the plants which didn't quite make it to edible size before the onset of the cold weather and which you'd like to encourage a bit.

Here are some ideas from what we do to achieve this.

1. Our whole garden faces roughly north to catch the maximum amount of winter sun.
2. We think carefully about where we plant late summer and winter crops. We plant the winter ones higher up the hill so the cold air doesn't collect around them. We also locate them in front of walls where warmth will be absorbed during the day and then released at night. Some warmth is also reflected to the plants in daytime. We have avocado trees (seedlings as yet) in such a position and they have survived their first winter. Trees are also good protection, keeping in the warmth of the day.
3. We protect plants with bags and mulch. This is mainly for the fruit trees (for example citrus and figs) which are a bit out of their rangeup here. The idea is to keep them warmer for a few years till the tender growing tips are less in the frost range, that is, near ground level. We also try to predict when the first frosts will arrive and the evening before we cover everything in the garden that might be affected.
4. We plant close together so the frosts are unable to penetrate to the stems.
5. Our winter garden: this began as an effort to cause the spring and summer to come early and autumn and winter late. It's a way to negate the effect of early and late frosts and make the late-sown carrots continue growing so we'll be able to eat them.

In our area we have lots of old mine shafts, each with their attendant mullock heap. These heaps contain plenty of lovely black slatey rocks. We began by terracing our garden with the black rocks working on the theory that if our house is warmer in winter as a result of the thermal mass in the concrete slab floor then a bit of thermal mass might not go astray in the garden.

And it worked. The gardens are around a metre wide with say 300 mm high walls of rocks between each bed. For the past three years our carrots, parsnips, cabbages, onions and spinach have continued to grow, albeit slowly, through winter, and have stayed juicy and sweet as well. This year however, we have extended our winter garden.

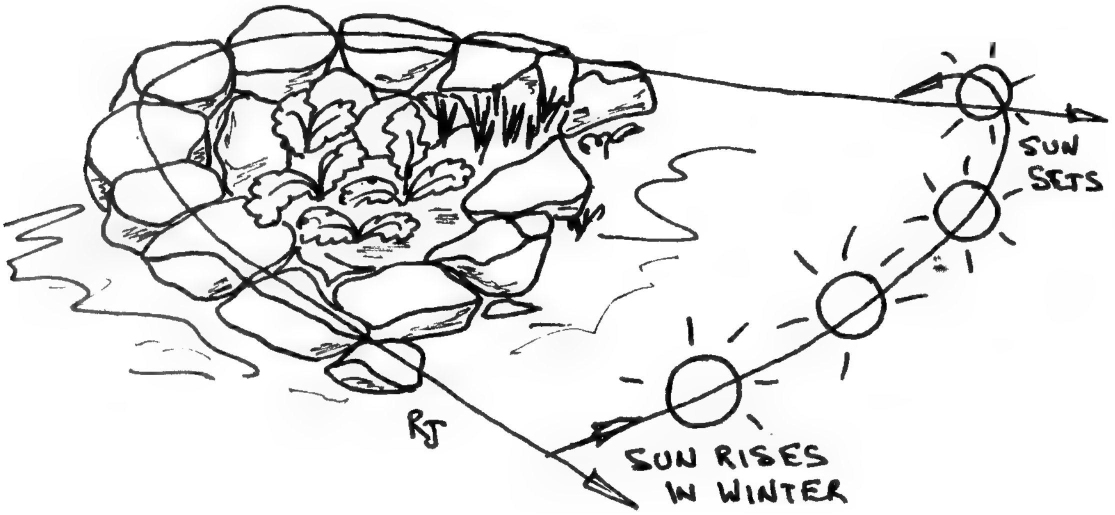
Over the past few years, through adding compost, the gardens have tended to overflow their black rocky confines. Now we have plants in between the rocks as well. Many of these plants are weeds but since a lot of our garden, in particular onions, celery, spinach, parsley and carrots, are self sown and the seeds are not particular about where they fall, we also have vegetables growing on and between the rocks. They are doing very well too.

The carrots are almost impossible to harvest, growing as they do with wonderful contortions between the rocks, but the leafy vegetables are fine. The scraps of soil they reach between the rocks are rich combinations of compost and chicken manure. The extra heat — and possibly also water, since in the rocks there is more runoff and less evaporation — means that we have lovely vigorous plants right through winter.

Our next step is to extend the idea and have a couple of gardens which are solely winter gardens. A further refinement will be to arrange the rocks so they use passive solar collection to the best advantage. This will mean not only facing them north but also curving them so they receive maximum winter sun.

As any person who has anything to do with things solar will know, the sun does not rise in the east in winter. It rises north of east and sets north of west. So the rock pile will be semicircular with arms curving to the north of east and to the north of west.

With a larger, more continuous rock pile and plenty of rich soil, who knows what we'll achieve. Maybe an impossible mass of weeds, but we hope it'll be a greater wealth of fresh vegies for winter.



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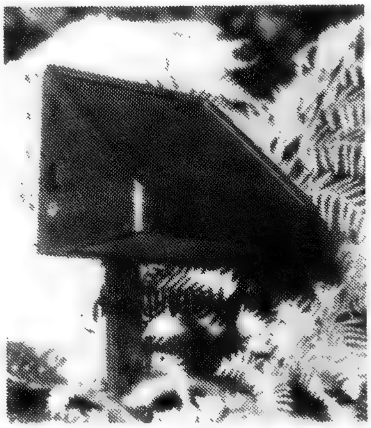

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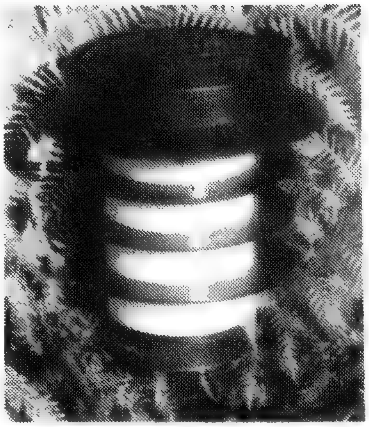

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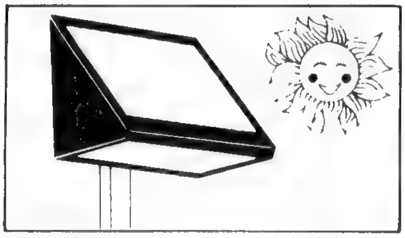

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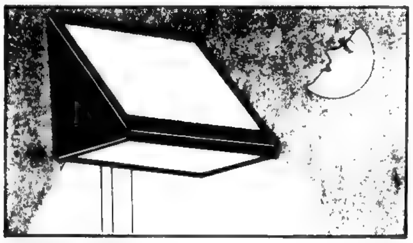

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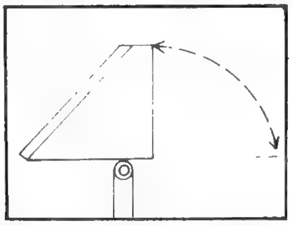

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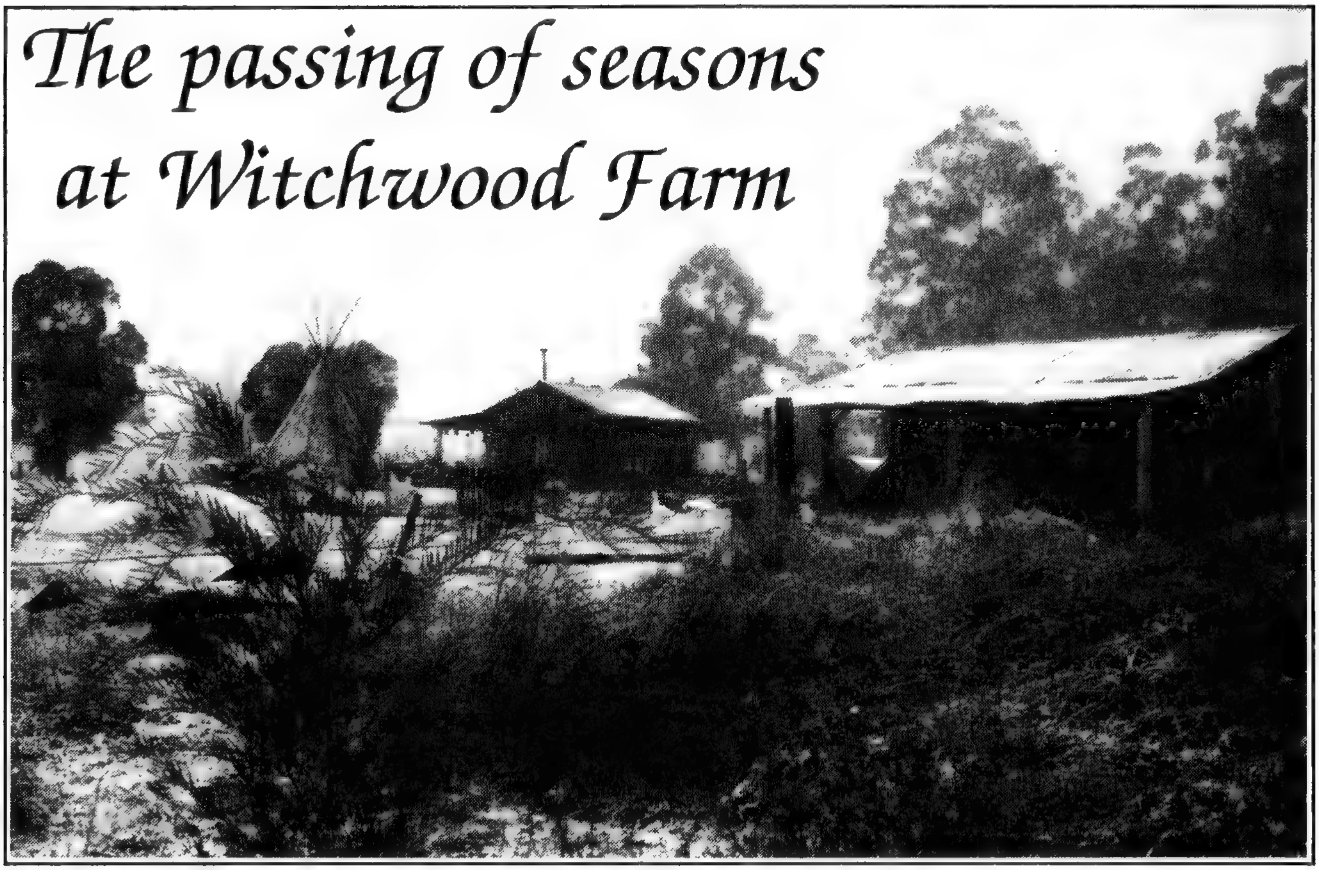
The passing of seasons at Witchwood Farm



by Jill Redwood

Goongerah, Victoria.

THE SOFT misty twilights of winter are as enjoyable as the long shadows at a summer sunset. Ahh . . . the contented feeling of coming in from a day's work and knowing there'll be time for relaxing by the fire. A bowl of potato and leek soup on the knee, a pencil and paper or book in the hand and two big hounds to curl up on the floor by my feet: the cosy delights of winter.

I could never complain about winter, or take it for granted. It has so many visual treats to offer as well. Especially for those of us who live in the south and are lucky enough to see frost and snow, or a pattern of bare branches against the landscape, wild ducks winging through the twilight sky or leaves in stilled reflections on a quiet stretch of the river.

These are some of the many winter scenes on "Witchwood Farm" that I never tire of. And over this bowl of homemade soup, I think back on how many winters it's taken to get here.

I found myself in this verdant little valley in the mountains after eight years of living in various shacks and huts in the backwoods of Gippsland. I'd tried the dicey situation of land sharing and the insecure position of tenant farmer until I finally came to this tiny Shangri-la.

A 22 acre stretch of river flats was on the market. Due to a couple of wet years and the previous farmer's methods of land management, it looked more akin to a 22 acre swamp. I bought it regardless.

When people take on the task of establishing a farm, they tend to be bound to it for a long time. This is even more true for a one person show. So, I decided to do a 700 km ride through the mountains on horseback. It was an adventure I'd wanted to do for years and I knew it was now or never. Once that little trek was out of my system, I set to with my newly purchased swamp.

I moved onto the land in summer after spending the previous winter living in a tipi and working as a labourer up at the nearby Snowy River National Park. This provided some handy cash to buy essential bits and pieces like a decent chainsaw, polypipe and fencing materials.

Four years, 200 trees and a few drainage lines later, it's now a manageable small farm that looks like a garden of Eden (see the back cover of the previous issue of Earth Garden). And of course I've left a stretch of swampy billabong in the middle for the frogs and wild ducks.

Unlike practical and sensibly-minded people who settle and build, I put house building last on the list of priorities, and farming first; although my somewhat substantial collection of feathered and four-legged beasties had some bearing on this decision.

I haven't regretted the time and energy I've channelled into their needs, as I find the contact with animals one of the most enjoyable aspects of living on a small acreage. In fact they are one of the few sources of consolation and sanity when at times I've felt like chucking in the towel. Stroking the velvety nose of a draught horse, scratching the shoulders of ol' Nanny, or even just watching the chooks go about their "chooky" business . . . it's all wonderful therapy.

My farm has also been host to many orphaned and injured native animals over the years. While I write this a kookaburra with a broken wing is watching over my shoulder.

My cosy little bark cottage — shelter from the wintery elements — took about two months of sporadic effort to build. I enlisted the help of a neighbour with a truck and paid back this help with a system of work exchange. The truck's tray made working on the roof frame very easy. I've used bush poles for the frame and bark for the walls. The local tip provided the old windows and door while good quality secondhand roofing iron came from a junk yard. A compromise had to be made with the bush poles because they had to be cut from the nearby forest. I've since planted many more than I've cut and I intend to go on planting trees until I peg out.

The fence posts for the farm were split from local stringybark. I used the thick bark from these trees on the walls of the cottage. It makes very effective insulation if gaps and loose joins can be avoided. The sheets of bark that didn't peel off too well or were too thin for the cottage were used for animal sheds, the dunny, and the worst used for muddy walkways or garden paths. The drier the season the more difficult bark is to peel, no matter how much of a battering you give it.

Yes, of course, the local council was keeping a close eye on me, but with the tipi pitched next to my 'farm shed' as my tent dwelling, all appeared to be legal.

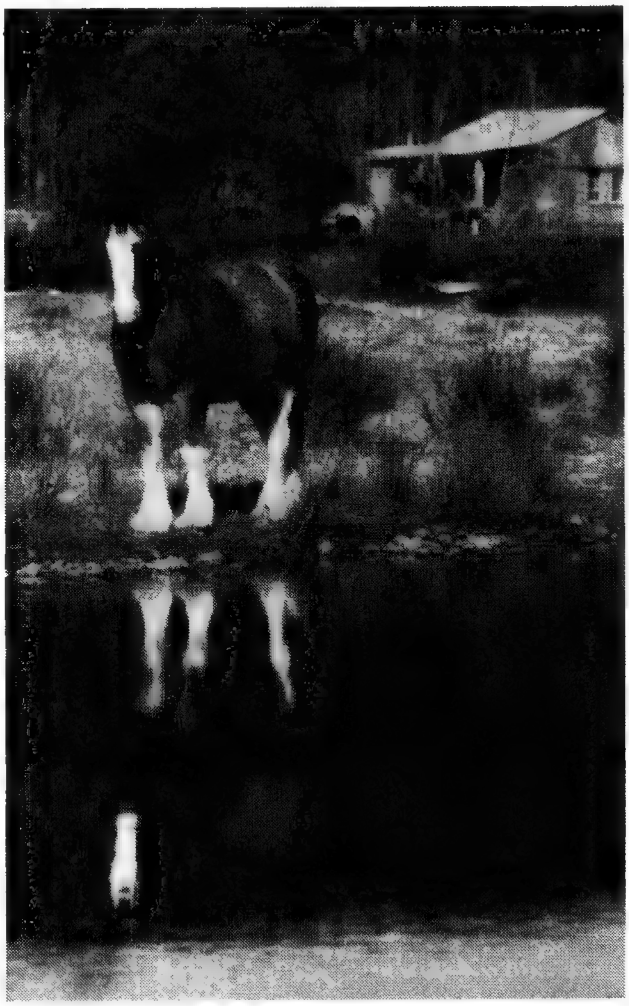
The five horses, a small herd of 20 dairy goats, and numerous chooks and geese are at least manageable. Sheds, fences, poddy pen, yards and a watering system for the stock are all now completed. Shelterbelts, shade trees and river revegetation are all thriving and beginning to dominate the farm scene at last too.

Every tree on this place has become like a friend with its own character and history. I sometimes imagine myself at 60 wandering around the forest farm in among the trees, being dwarfed by their size, having watched them through every season since they were frail seedlings in a handful of soil. What more worthwhile effort could anyone leave behind them?

As well as spending time with animals and trees, I also find time to play in the garden. No, not work . . . play. The garden is such an exciting and responsive throng of growing greenness that it's hardly a chore to get out amongst it. Not only has the garden kept me wholly in vegetables for the past four years, but often provides excess to share, preserve and feed the dogs. Dog junk food is bad news, not just for dogs but for kangaroos as well. A big pot full of vegies, grains and a bit of fresh meat does them for a week. Excess eggs and milk with the odd bone or three keep them in fine fettle.

So with animal needs, trees and garden established, my own house started to creep up the jobs list. "Build a house." Three simple words but what a daunting task! Having always felt a link with the past, I designed it after the style of an early settler's hut: steep pitched hip roof, wide verandahs front and back and slab log walls. The frame is made from stringybark poles, some eight feet wide and 15 feet long. Needless to say, fetching all these poles from the bush has taken many months of blood, sweat and tears.

I've had times of great enthusiasm and satisfaction working on the house, but also times of despair, impatience and feeling depressingly overwhelmed by the amount of work still needing to be done. I've learnt to take it not as one big, never-ending job but a series of smaller attainable jobs, like 'plane and fit door steps', 'fix broken window', or 'tighten strapping'. And it's getting there!



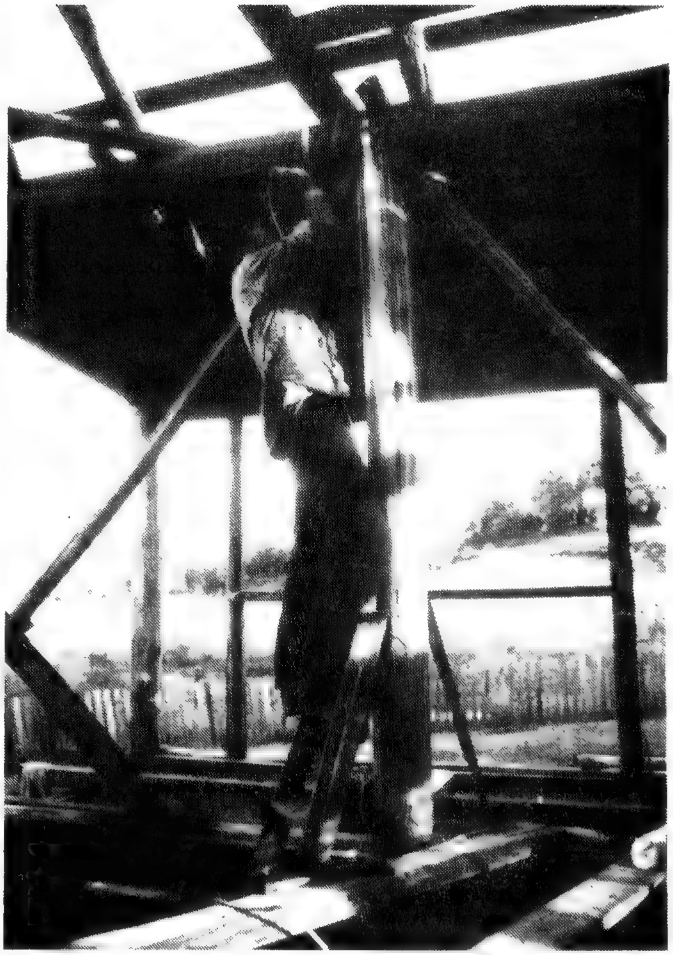
"Stroking the velvety nose of a draught horse . . . "

The bark cottage is cosy and organised, but I do look forward to the luxuries of a real house.

But living in the country aint all beer, skittles and manual labour. What's not yet exploited or developed in the country, is either in threat of, or in the process of being exploited and developed. The high-tech Japanese-backed Very Fast Train is still a real possibility through the forests of East Gippsland and down the centre of this valley . . . through my front door in fact! Many of us have been campaigning strongly on this issue and seem to have won the first round of getting a public enquiry set up to investigate the various impacts. Then there is the pulp mill proposal to fight, the South East forests near Eden to save, the ocean outfall sewerage pipe to stop, and the Japanese technopolies to thwart. Just for starters! It aint easy bein' green . . .

But next winter I hope to be in my new house, supping soup by the fire in a big comfy chair, playing around with my new projects (or campaign strategies) in mind: a grove of nut trees, a camping farm venture, growing the farm's grain needs using the draught horse . . . and the never ending cycle of seasonal work.

Many winters have passed since I played with a plastic farmyard set as a four year old. And the determination I had then hasn't waned in the least . . . if the VFT consortium wants to take my farm they'll have to use an infantry of armoured D7 bulldozers to make me move!



Right: Jill hard at work on the bush pole frame of her 'new' early settler's timber home.

Buying a wood heater

THE first thing to decide when buying a wood heater is just what you expect of it. How much heating you plan to do? Do you want to cook, or supplement your hot water? How big an area do you plan to heat?

Do you want to heat all day, just evenings, or overnight, and will you be using other types of heating as well? Is your house well insulated and free from draughts, and do you particularly want to see the flames? Do you have a particular shape or style of heater in mind?

If you can answer these questions before you do the rounds of the appliance retailers you will find it easier to select the right heater for your needs. If you match the heater to your needs you will get a far more satisfactory result.

How large should a heater be?

As a rough guide you will need a heater with a maximum heat output 1 to 1.5 kilowatts (kW) for each ten square metres of heated floorspace (one square approximately equals ten square metres). This assumes you have a draught-free house and adequate ceiling insulation. If you don't you will need a larger heater or, preferably, you should install insulation and remove draughts (see EG 56). Advice on these can be obtained from State Government Energy Information Centres in most capital cities.

Most of the better heaters state in their brochures how much heat they put out. Some brochures state what floor space the appliance will heat but this can be misleading because so much depends on the house itself. If the heater is too big then it will need to run on a low burn rate all the time. This is inefficient and produces more creosote and smoke. So, don't assume that a heater rated to heat 20 squares is the best appliance for a 10 square house.

At present a standard test to determine a heater's efficiency is being developed by the Australian Standards Association. The standard will be adopted for rating the efficiency of wood heaters in the near future.

How big an area can be heated?

You may assume that a large heater will heat most of your house. However, the problem is spreading the heat reasonably evenly through the house. Open plan living areas are usually no problem, but getting heat down from high ceilings, along corridors and into bedrooms can be more difficult, because hot air always rises to the ceiling of a room. In some cases, just leaving doors open does the trick but sometimes ducts or fans are necessary to distribute the heat more evenly.

Sometimes it is possible to heat the whole house with just a heater in the living area. In other cases a full central heating system would be required. Don't forget that the bigger the area to be heated, the more fuel you will use.

You will get better results from your wood heater if your home is properly insulated and free of draughts. If you are planning a new home or renovating an existing one, make sure your design includes the proven principles of energy conservation. Again, you can get good advice from State Government Energy Information Centres on ways to improve your comfort through design, insulation, proper window coverings and window insulation.

Will a radiant or convective heater suit me best?

There are so many heaters on the market that deciding whether a convective or radiant heater will best suit your needs is often a good place to start because it narrows the choice of heaters.

Radiant heaters are often, but not always, black. They have quite hot outer surfaces, up to 500 °C but usually 200-300 °C, and transfer roughly two thirds of their heat by radiation, the rest by convection. Radiant heaters warm up quickly, that is, if you sit close to them you can get warm even though the whole room hasn't had time to warm up. So they are useful if you come home to a cold house. However, radiant heaters give uneven heat across a room; it is warmer near the heater and cooler if you are further away. They also present more of a hazard, particularly for young children and the elderly, because of their hot surfaces. Radiant heaters transfer heat directly into the room from the hot outer surface of the firebox.

Convective heaters

Convective heaters have a ventilated casing set a small distance away from the firebox. This can be made of metal or tiles and has openings at the top and bottom to allow air to circulate freely between the casing and firebox. Air moves up between the firebox and second skin to extract heat and keep the outside relatively cool (100-200 °C). Roughly two thirds of the heat is transferred by this warm air, and the rest by radiation.

Convective heaters give more even temperatures across a room and thewarm air can be easily moved from one room to another. They do, however, take longer to warm the room up, as the air fills the room from the top down. High ceilings, therefore, make a room much harder to heat than low ceilings with this type of heater. Fans can help to overcome this problem.

Convective heaters have a ventilated casing around the firebox. Air is heated and circulates naturally around the firebox transferring heat into the room. There is no inherent difference in efficiency between radiant and convective heaters. The choice will depend on your preference for appearance and whether or not you need a fast warm up.

How good are fireplace inserts?

Some heaters are designed to fit into a brick fireplace. These heaters can be open to give the effect of an open fire. Although more efficient than an ordinary fireplace, they have relatively low efficiencies because a lot of air still goes up the chimney, even though some include dampers in the flue.

You can also buy fireplace inserts that are controlled combustion (airtight) heaters. They are slightly less efficient than equivalent free-standing heaters (say, 5 to 10 percent less efficient), but they can save valuable floor space if an unused fireplace is available. They are also usually a bit cheaper to install. The big advantage of this type of fireplace insert heater is that it is far more efficient than the open fire it replaces, giving five or six times as much heat for an equivalent amount of wood. Fireplace insert heaters rely mainly on convected hot air for heat transfer.

Are fans important?

Fans can either be built into a heater, located on the ceiling, or elsewhere in a room. Fans in a heater can result in increased efficiencies of up to six to eight percent. They give larger volumes of warm air rather than small volumes of hot air, by rapidly circulating the air in the room being heated. This means less temperature stratification (hot air layers at the ceiling), which can be important if you have high ceilings. It also means a cold room warms faster.

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Fans can also be useful in fireplace insert heaters, where it is important to extract maximum heat from around the enclosed firebox. Offsetting these advantages is the fan noise and occasional fan maintenance or replacement. In some heaters the fan must be used to prevent overheating, in others, use of the fan is optional.

Fans on the ceiling can be useful in spreading the hot air which collects near the ceiling. Devices are also available which suck the warm air from near the ceiling down a duct and blow it out at floor level. While fans might not have much effect on the actual efficiency of a heater, they can lead to substantial fuel savings because the heat that is released from the heater is used more effectively in the living space.

Should the heater have firebricks?

Firebricks protect the metal firebox, giving it a longer life. However, they might not protect the whole inside of the firebox, as the firebox is sometimes only partially lined. They take up some of the space in the firebox which otherwise could hold fuel. The extra mass of the bricks means the heater takes longer to warm up, but heat output is more even and the heater takes longer to cool down when the fire goes out. Firebricks do not necessarily improve a heater's efficiency, but can keep fire temperatures high for more efficient and easier combustion.

Welded steel or cast iron?

Welded steel and cast iron are both satisfactory for solid-fuel heaters. If steel is too thin (less than 6 mm) then it might warp or burn through sooner than it should, unless it is protected by firebricks. If cast iron is too thin, or of poor quality, it might crack. Check for pitted surfaces and poor joins between pieces before buying.

What flue should I use?

The correct flue is an essential part of any solid-fuel appliance. The flue must be the diameter specified by the heater manufacturer. It should be high temperature stainless steel or enamelled steel (the enamel must be on the inside and outside of the flue-pipe). Never use galvanised or mild steel, such as old oil-heater flues, because they are unsafe. The casings which go around the flue on freestanding heaters can be a galvanised steel or copper (decorative).

Building regulations require that all flues have to be either of the type specified in the Australian Installation Standard for Solid-Fuel Appliances, or the flue must have been tested with the particular heater and shown to be safe.

Is dual burning or secondary combustion important?

Some heaters are claimed to burn the smoke twice. This can't really happen, but good design, including baffles and a well mixed air supply, can ensure that combustion of the wood is more complete than in poorly designed heaters. Modern heaters have a secondary air supply which is intended to give more complete combustion through dual burning, again good design is the important point. In a good design, dual burning can give increased efficiencies with reduced emissions.

Some manufacturers use catalysts to achieve improved performance and reduce emissions. Unfortunately, there is no simple way to determine whether a particular design is a very efficient one. *Choice Magazine* (May 1987) carried out efficiency tests using the draft Australian Standard Association test. Some manufacturers have also had independent tests done in the United States.

Can I cook on the heater?

Many wood-fuel heaters are designed to allow some cooking on the hot top surface of the heater, which is sometimes covered by a hinged or removable cover. If you plan to do a lot of cooking, we advise you to look for a slow combustion cooking-stove rather than a heater. The heaters are fine for percolating coffee or keeping a meal warm, and other minor cooking tasks, or for use in the case of a power cut, but they can be difficult to clean if food is spilt and they generally cook more slowly than the cooking stoves. Not all heaters are suitable for even occasional cooking, for example fireplace insert heaters. If in doubt, ask the retailer to demonstrate the cooking surface.

Can I heat water?

Most wood heaters can be fitted with a water heating coil or wet-back. If you plan to heat domestic hot water or water for space heating, make sure that the model you select does have that option. You must also have a suitable hot water cylinder located reasonably close to the heater, otherwise installation costs might be very large, or the system may not function satisfactorily. The Victorian Solar Energy Council brochures, "Water Heating Using Wood" and "Installation Checklist for Wood Heaters" have more details.

What are the cost and efficiency trade-offs?

A table of comparative running costs of heaters using different fuels was published in EG 62, but running costs are only one part of your total costs. If your most important requirement is to keep costs to an absolute minimum, you should look at the lower priced heaters. These are likely to be less efficient than the improved controlled-combustion heaters but a $500 saving on the heater will buy a lot of fuel.

For example, a $500 (installed) pot belly heater, if carefully used, could have an efficiency of 40 percent. An improved controlled-combustion heater with an efficiency of 60 percent might cost about $1000 (installed). Say you used four tonnes of wood per year in the more efficient heater you would require six tonnes for the same amount of heating in the less efficient heater.

The saving with the better heater would depend on the price you pay for firewood. At $90 per tonne in major cities the $180 per year saving would soon cover the extra cost of the better heater. But in country areas, with wood at $35 per tonne it would be more than six years before you were ahead. The cost comparisons can be a little misleading because in practice, you would probably use about the same amount of wood in either heater, but just heat a bit less of the house with the less efficient heater.

Will the heater burn overnight?

If you want to run your heater 24 hours a day, do not choose an open fire or non-airtight heater. Airtight heaters without grates, that is, heaters where the wood sits on a bed of ash, generally burn longer between refuelling. Such heaters will very likely burn all night (that is for more than eight hours on one fuel load), provided they can hold 10 kg or more of wood. Check for yourself what 10 kg of wood looks like (it will be three or four medium-sized logs).

Unfortunately, it will take you some time to get the feel of operating your heater all night, although some heaters claim to burn overnight when they won't. If you are misled, report it to Consumer Affairs.

Where should I buy a heater?

Before buying, it is a good idea to look at a number of different brands of heater. Get brochures on the heaters you're interested in and study them carefully to make sure they have the performance and options you're looking for. Wood heaters are sold by specialist heater shops which often carry a wide range of brands (see the Yellow Pages) and by some of the larger retail home improvement shops.

Many retailers are members of the Australian Woodheating Association. This group has been formed to promote wood heating and assure high standards of service and reliable information on appliances. So look for retailers that are members for advice. You might also find it worthwhile to ask your friends who have bought and operated wood heaters, or check with Consumer Affairs to see if a particular retailer has consistently given poor service or bad advice.

If you are not satisfied with the performance of your heater, check with the retailer, there might be some simple reason why you are not getting the performance you expect.

How good is the warranty?

Always check heater warranties carefully before buying a heater. In some cases the warranty is for different periods on different parts of the heater (for example five years on firebox, and one year on catalyst). Some parts might not even be covered (sometimes glass doors are not covered). If in doubt, check with Consumer Affairs to see if a particular retailer or brand of heater has a history of customer problems.

Slip-sliding away . . . good access!

by Chris & Rhonda Martin
Coonabarabran, New South Wales.

A MOUNTAINOUS bush block is a sight to behold but can be a nightmare when it comes to gaining access to your house site and other points on the land. In fact we consider access for vehicles just as important as a reliable water supply. The problem is that these two essential needs are polarised, because ideally any proposed land needs to be examined when it is driest to gauge water supply, and when it is wettest to examine the best vehicle routes.

Short term exploration on foot is a good way to inspect an area but an extremely difficult way to build, especially on sloping terrain. We have heard of people who have preferred to keep their surrounding environment as pristine as possible and have carried everything into their chosen site. We admire them for this, however, considering the tonnes of material needed to make the average home and the household effects that seem to accumulate, some sort of vehicle access makes good sense.

We know what it's like not to be able to drive right to

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the site. The first part of our home was built using a flying fox to carry concrete for the footings and the mudbricks were lowered down the hill by mini railways using ourselves attached to the trolley by rope as an engine to haul it up and down the slope.

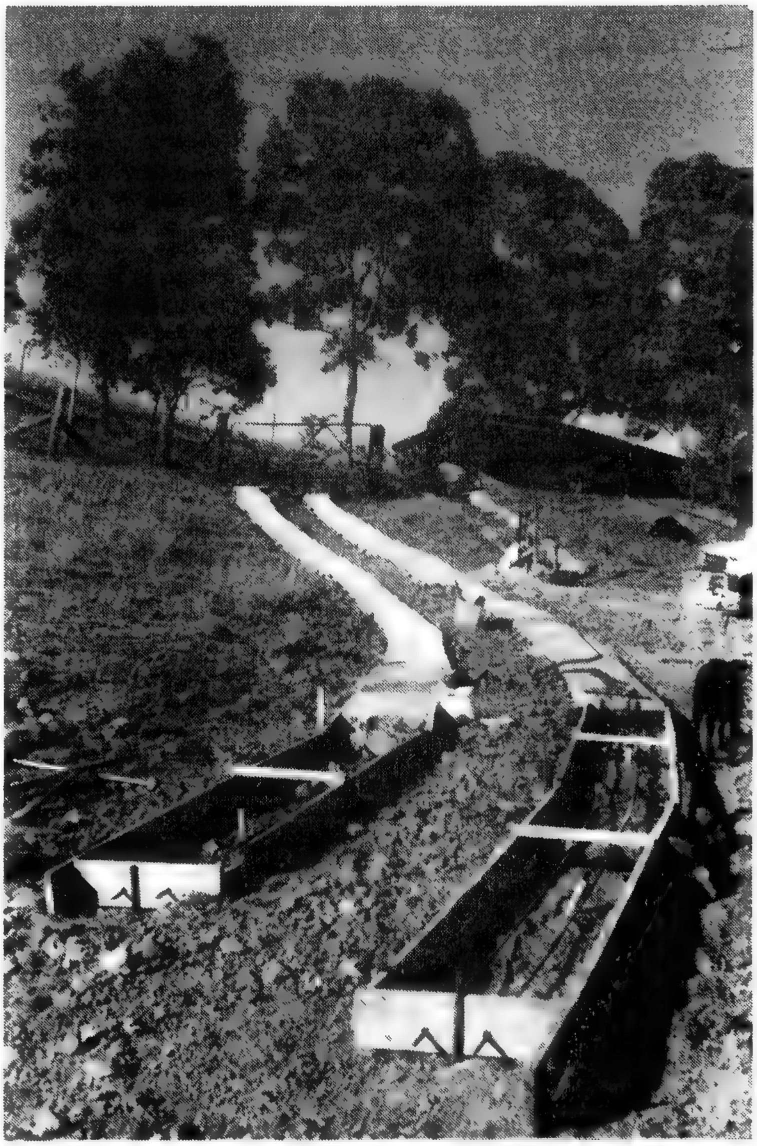
We are very concerned when we see advertisements for land stating "4WD access only" because such access can be fraught with problems. Four wheel drive vehicles are not, as many people are lead to believe, magic carpets. The maintenance of these types of tracks can be very labour intensive and costly, not to mention the wear and tear on a 4WD vehicle, which is more expensive to maintain than an ordinary car or ute.

Over the years we have been bogged in some interesting places. It can be part of exploring our wonderful country but can become very wearing on both body and transport if it happens too often.

Some experiences in getting bogged are unforgettable such as the time Chris drove into a new area and got out of the car to scout ahead. On turning around he found that the car had disappeared to the axles on all four wheels.

An old bushie showed us how to test for unstable ground and we haven't been stuck since. He always carried a one metre length of 12 mm (half inch) steel rod with him and when suspicious of soft ground he simply poked it into the earth. If it went in more than 300 mm (one foot) or muddy water oozed out it was unsafe to proceed.

On our land, because of the magnificent view we decided to build about 50 metres above the valley floor. This has proved to be an average of 4° Celsius warmer in winter, because it is less frosty, and 4° Celsius cooler in summer, because the site is more exposed to the breezes. It does subject the house to the strong winter winds more often but it's easier to warm it using alternative energy than it is to cool it.


Concrete strips being laid by Chris and Rhonda, with the formwork and reinforcing exposed.

There are many methods to choose from when considering access construction. They can range from paving bricks, through the standard concrete apron to corduroying using old sleepers or their offcuts called sleeper backs.

We discussed three methods that either were appropriate or could be built to suit our terrain. These cost about the same to put in but have differing labour inputs both initially and for future maintenance.

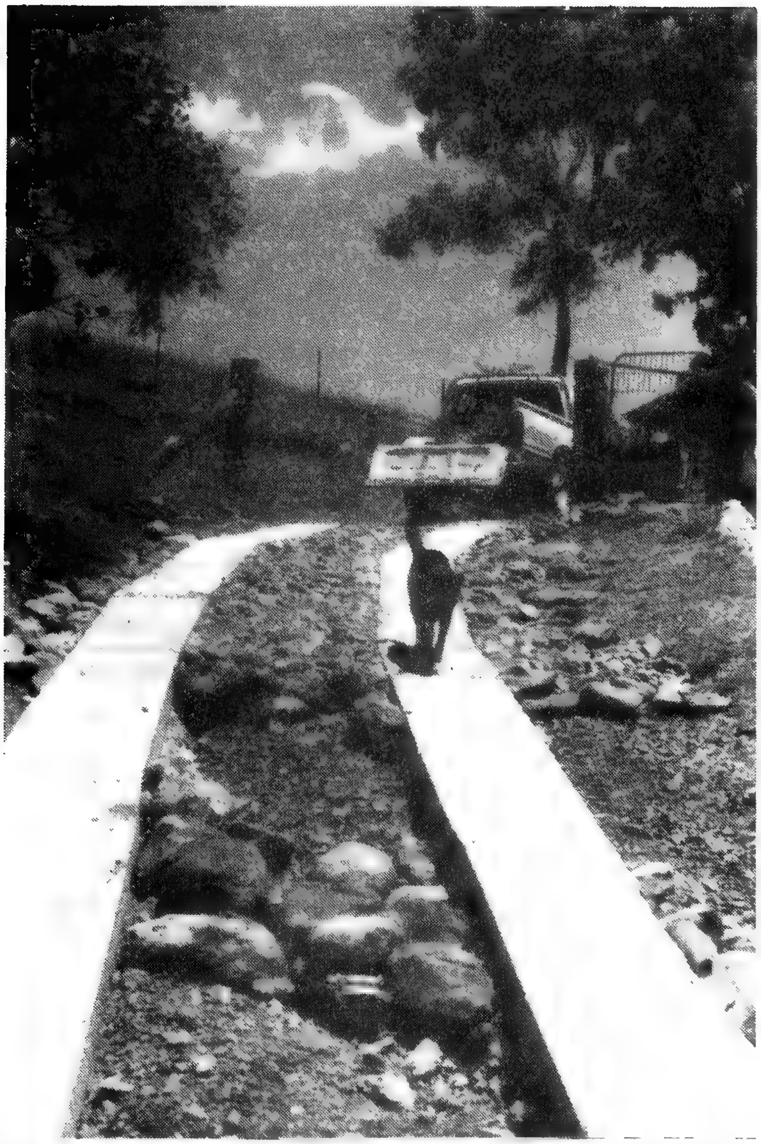
Graded track across the slope

This is probably the soundest environmental initial approach. A sympathetic plant operator can do an excellent job, providing the soil will compact reasonably and does not have too high a clay content. It is essential that you are there when the work is being done because of misunderstandings and differences of opinions that could occur. It's too late when the work is done! This method is more suited to lower rainfall areas — less than 1,000 mm per year — because wetter areas usually require more cross drains and culverts which can become prohibitively expensive.

The main disadvantage is that it is not very aesthetically pleasing and, depending on the length of track, can leave an obvious scar on the landscape which takes a long time to heal even if revegetation is undertaken.

Rocking-Concreting

After bashing our way up our 30 degree slope on an ever degenerating track for the past three years we decided that we had to reorder priorities especially when visitors, after bouncing from rut to rut, asked what 4WD vehicle we owned and were amazed to be told that we didn't have one.



"Rocking in" the space between the concrete strips. So far 32 ute loads of rock and gravel have been put in place.

We first thought of using river rocks, which would have been more pleasing to look at, but figured that it would have taken much more time to level them and just as much cement and sand as concrete strips.

After checking out the price of ready mixed concrete we found that by buying the metal mix and cement and using our own mixer we could save about 40 percent. The other advantages were that we only needed $40 of timber to use for formwork and were able to do the work when we felt like it. If we had used ready mix we would have had to pay over $200 for the formwork, with little chance of recycling it, and would have been exhausted, because having to lay so much concrete in a short time is totally debilitating.

An important point to remember if laying strips is to have the timber as long as possible, up to 6 metres if available, if curves are involved. Short lengths can't be curved easily and sharp corners are the result. This then causes a difference between the radius of the inner edge and the outer one because the corners do not end up opposite each other. It is then very difficult to keep the vehicle on the strips as the alignment of the wheels is constantly changing.

Due to the gradient of the slope we made 150 x 450 mm strips and drove old steel pegs and parts of star posts into the ground to provide good anchor points. When laying the concrete we started at the bottom of each section and covered the formwork to half its depth, going up the slope, to join up with the end of the previous section. Once completed we started at the bottom again as we found that it was very difficult to level the concrete if we poured it to the full depth all at one time.

As it was, mixing 8 cubic metres of concrete (which weighs over 16 tonnes) and carrying it in buckets was no mean feat. At the start of the work we invested in two metal buckets. These were expensive, at $25 each, but when we think of how many plastic ones we have broken over the years building the house they are a very good investment.

The best ones are the type where the handle fits into eyelets on the top of the bucket. The ones with side fittings tend to pull out when you're carrying heavy loads.

We were also distressed to find out just how much erosion we had caused by not doing the work earlier. The problem is that the erosion happens gradually and we didn't realise how much soil was missing until we went to fill in between and around the concrete strips. So far we have carted 32 ute loads of gravel and river rocks and are still not finished as the big wet has interfered.

Eventually we hope to soften the track and adjacent slope using prostrate herbs.

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The Neem Tree

by Edwina Toohey

Ravenshoe, Queensland.

THE NEEM tree was first planted in Australia over 100 years ago but only now has its importance been promoted here. 'Neem' is a variation on the Hindi word 'Nim', meaning 'perfect' and this tree has been growing in India for over 4000 years.

Of recent years this tree has attracted much attention because its seeds produce a natural pesticide, harmless to humans and all other mammals. The pesticide, azadirachtin, is a powerful antifeedant which is active against a wide range of insects. Antifeedant means that the tree has a smell or bitter flavour that the insects can't stand. And this natural pesticide, azadirachtin, has been shown to kill insects very

Right: leaves from the sapling (left) and the seedling (right) of the neem tree.

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effectively in very low concentrations of the chemical.

The pesticide will be commercially available in Australia this year from local manufacturers. Trial plantations of the Neem tree are being planted in North Queensland, as the tree ideally grows in tropical monsoonal climates. At the mining town of Weipa, the Neem tree is being planted to regenerate mined areas.

The trees produce seed three years after planting, and continue to seed up to 100 years old.

There are not enough trees in Australia to supply the demand for its seeds, so they are being imported from Africa and Asia for the commercial extraction of the natural pesticide.

Dr Martin Rice and the staff at the University of Queensland Department of Entomology have been researching the effectiveness of this natural pesticide for some years and with the Department of Primary Industries are involved in the trial of a number of Neem varieties from various countries for future planting in tropical Australia. Propagation of these tree seeds is taking place in the Mackay region with seeds being made available to landholders at one dollar a piece.

Enquiries about the Neem tree may be made to your local Department of Primary Industry office. The timber of the Neem tree is also noteworthy, because it is resistant to termites.

The National Association for Sustainable Agriculture, Australia Limited

Box A360, Sydney South Post Office,
Sydney, NSW, 2000.

CERTIFICATION SCHEME SAFEGUARDS FARM PRODUCE

Television personality George Negus recently launched the new National Association for Sustainable Agriculture (NASAA) label poster. The location for the launch was the cold storage dock of Steve Alexander's organic food warehouse, "Lettuce Deliver", in Cecilly Street, Lillyfield, Sydney {phone (02) 810 3164}.

The purpose of the poster is to publicise NASAA's new 3-level certification scheme. Under this scheme farmers who manage their properties organically can market their produce under one of NASAA's three labels.

* The **Grade I Organic** label can be used on produce that is grown without the use of synthetic fertilisers, pesticides, growth regulators, antibiotic or hormone stimulants, or intensive livestock systems. This label is awarded to farmers who have observed sustainable practices for a minimum of several years.

* The **Grade 2** label is used on produce that is grown on systems in a state of transition from conventional to sustainable practices. The same restrictions apply as for Grade 1, the only difference is the length of time since synthetic products were used.

* The **Grade 3** label applies to produce which has been grown with the use of small amounts of non-permissible substances. Farmers in the early stage of transition to sustainable practices may opt to farm at this level before withdrawing completely from synthetics.

In the year since the scheme was launched over 130 farmers have applied for certification and there is a rapidly growing trade in organic produce. In 1989 this trade is predicted to be worth $2 million in Sydney and $4 million in Melbourne.

In the past there have been no foolproof means by which consumers could identify organic produce. They had to take the word of their supplier.

Under the new NASAA labelling scheme, certification is based on farm inspections and chemical tests of soil and/or produce. NASAA's procedures, which conform to the standards of the International Federation of Organic Agriculture Movements (IFOAM), are designed to reassure consumers that the produce is both free of chemicals and has been produced in a way which regenerates rather than degrades agricultural soils.

Season by Season

Earth Garden's regular organic gardening column, written by Jackie French

Braidwood, New South Wales.

How to have a pest free garden. Strategies for pest prone plants, sunflower oil and sunflower artichokes, dandelion coffee, dandelion greens and roots for baking, growing rice, soybeans, millet, chick peas and adzuki beans — what to do with them — and more.

SPRING exists. Things start to grow like they've been dreaming of it all winter, shadows turn black instead of purple and the higher sun angles show the cobwebs that have accumulated over the past few months.

Leave them be. Spiders are fantastic predators (the ones that make the webs won't be poisonous ones anyway. Redbacks and funnel webs like hiding and scuttling). They eat silverfish indoors, earwigs outdoors and a whole range of other pests like moths and flies. If you are really worried by the webs take the broom to them, or spray with powdered sulphur. This won't kill them — just deter them from making their nests there.

Spring is a good time to reorganise your garden for pest control — natural pest control — which means relying on predators to do most of your pest control, and good garden management for the rest. Here are some steps to a garden free of pest problems.

1. Have a healthy garden. Healthy plants, like healthy people, tend to stay that way. Fertilise with compost, keep up the watering, and don't try to grow plants unsuited to your area. If your seedlings keep dying they're trying to tell you something.
2. Tolerate a bit of damage. A few holes in a cabbage leaf don't matter; one blotched tomato out of a bagful can be spared. If your garden is producing well you can afford a few losses anyway. Concentrate on growing things, not killing them. Some pest damage is inevitable and even desirable. A few pests will encourage predators and these will help stop more pests building up to destroy your crop. Only bother about pests if the damage is more than you can bear.

3 Plant year round flowering plants. The adults of many predators feed on blossom. Plant lots of flowering natives around your garden, and let a few vegies go to seed. Blossom also attracts nectar-feeding birds (they may feed on insects while nesting) and insects: food for insect-eating birds.

4. Always have fresh water in the garden. This will attract birds (who can clean up about 40 percent of your pests). It will also attract many wasps, icheumenons, hoverflies, dragon flies and other predators.
5. Try barriers of deterrent plants. Most aromatic herbs like lavender and wormwood and tansy will deter pests; flowering nasturtiums will deter pests like aphids flying over them. A warning though: many aromatics drip a mild growth supressor from their leaves when they are watered. Keep them a little away from your vegies, say, in a border around the garden.
6. Make your garden as dust free as possible. Dust can kill predators. Also, increase ground covers and dig as little as possible. Digging will also disturb ground predators like beetles, predatory nematodes and millipedes.
7. Plant shrubs, trees and other barriers to protect you from dust and pesticides which may blow from roads and neighbours.
8. Encourage mycorrhizas. These are one of the unseen, but important influences on plant health and their ability to cope with disease. Mycorrhizas are symbiotic associations of plant roots and fungi. The fungus either forms a sheath around the root tips of the host or invades the host cells. The mycorrhizal fungus exudes growth substances which stimulate young roots to fork so that more nutrients can be absorbed. Phosphorous uptake, for example, can triple. The fungal sheath may also release nutrients if needed.

Mycorrhizal fungi also produce antibiotics that suppress pathogens like phytophthera root rot. Plants with mycorrhizal infections are more disease resistant.

Encouraging mycorrhizal infections

Specific fungus spores need to be available to encourage mycorrhizal infections: transfer soil from old, diverse gardens with plenty of native species. Mycorrhizas flourish with other soil micro-organisms, soil humus and a decomposing litter layer, so dig as little as possible, mulch, and have as few neat empty spaces in your garden as possible.

Many other soil microflora can help the plant resist pathogens, either by directly attacking the pathogen or dissolving phosphates and other nutrients to increase plant health. Decayed organic materials help protect plants. Potato scurf for example, (which can also affect beans, cotton, cabbages and other crops) is suppressed by bacteria and fungi that thrive in decomposing organic matter.

Some management ideas for pest-prone plants

•Improve the soil with mulch or compost and otherwise reduce stress.

•Time your planting better to avoid pests or attract predators.

•Control ants that may carry sap-sucking and honey dew-producing pests.

•Consider whether the plant is really suited to your area. Dig it out if necessary.

Seasonal jobs

The major job now is planting things. Don't be in any hurry. Seedlings planted in cold ground don't grow as fast or as well as later ones. When in doubt feel the soil. If you wouldn't like to sleep on it the plants won't either. Also, early plants are often more pest prone. Firstly, because pests breed earlier than their predators, and secondly because . . . well, just because. Maybe because, as I said above, healthy plants are less pest and disease prone, and it's hard to be healthy when you're feet — or roots — are cold. But try it. Plant an early lot of beans and watch them being eaten by bean fly. Plant another lot and watch them thrive. Plant early broad beans and watch the black aphids crawl down their leaves and suck the life out of them. Plant later ones next door and they won't be touched.

Crops for spring

Sunflowers

Sunflowers grow in almost any garden. Plant them when the soil warms up. The cheapest seed is a packet of parrot mix. Keep them weeded or better still, plant them thickly so that they outcompete the weeds and prop each other up. You won't get such big flowers of seed head but the yield per plot will be the same, for less work. Pick the head young for eating, or let the seed heads dry on the stalk till they shake out easily if you want the seeds for oil or eating.

Sunflower seeds can be hulled and eaten raw. I don't know any way of hulling sunflower seeds easily. We just bung them in a paper bag and press the rolling pin over them a few times to crack the shells. They usually come off much more easily after this.

You can also cook them. They are excellent hot. Try them fried in oil with garlic, or add them to rice dishes, or where you'd use pine nuts.

Sunflower butter

Shell the seeds, place them on a tray in the oven and cook at a moderate heat till they start smelling caramellish and are just beginning to change colour. Take them out, grind them in the blender or even through a coffee or flour mill, and there you are. Sunflower butter is a bit blander than peanut butter — it's best with honey. It makes a good dipping sauce with a bit of lemon juice and perhaps salt added to it. Actually the whole sunflower head can be eaten, if you pick it young enough. They can be pickled while they are still soft, or eaten like artichokes.

Sunflower artichokes

Pick your sunflower head while they can still be squeezed without feeling any seeds — the smaller the better. Steam them for 20 minutes. Toss them in olive oil and lemon juice. Eat hot. They are also good with melted butter with garlic and lemon juice.

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Sunflower oil

This is one of the easiest oils to make at home. It's certainly worthwhile. About 30 percent of the sunflower seed is oil. So for every bucket of sunflower seeds you'll get nearly a third of a bucket of oil, and a good thickly-planted plot will give you a lot of seeds. The pulpy residue makes good chook or bird feed, or you can use it for the sunflower coffee recipe below.

Take very ripe seeds. Green ones have much less oil. Pulverise them or put them in the blender. Then suspend the cracked seeds in cheesecloth over a jar and gently squeeze the pulp till all the oil is removed. There is no need to hull the seeds for oil making.

This makes a good clear, 'first pressing' — your top quality sunflower oil for storing.

For a second pressing pour boiling water over the pulped seeds, leave overnight, then strain off the oil. This oil won't be so good. Keep it in the fridge and use within a month or two. You can try a third or even fourth pressing if you want to but the oil yield will be less and will get progressively cloudier.

Sunflower coffee

This is made by roasting sunflower seeds till they are brittle (there is no need to hull them) then grinding them finely. You can also use the seedy pulp after you've extracted the oil. Use twice as much ground sunflower as you would coffee in your pot, add boiling water (I use a heaped tablespoon of sunflower coffee per cup) and let the sediment settle before drinking. It has a fine rich flavour when used fresh but becomes insipid after a day or so. This is unfortunately true of most coffee alternatives. One of the reasons coffee is so popular is that it keeps it fragrance for years. If you've had 'imitation' coffee and disliked it you may change your mind once you've had some freshly roasted.

Dandelion

This is another 'coffee' crop, though there are many other uses for dandelions. Dandelions grow almost anywhere. They are perennial weeds, with a long tap root and yellow flowers in spring and summer. Improved dandelions can be grown from seed and planted in the spring. They are hardy and vigorous.

Dandelion coffee is made from dandelion roots. The leaves are also edible, but dandelion should be grown as an annual, with the seed sown in spring, if it is to be eaten fresh, otherwise the leaves are bitter.

Alternatively the leaves can be blanched by covering with mulch or an old fruit box for about a week before picking. Older plants give fleshier roots for coffee. Dandelion roots are also good eating, but they can be tough and fibrous if they're too old. If you can't cut them with a blunt knife keep them for coffee.

Dandelion coffee

Dig up your root: the older the better for dandelion coffee, because the roots will be bigger. They also seem to have more flavour once they've over wintered. Scrub them (you can peel them if you like, but I don't bother) dry and chop them, then slowly roast them in a cool to moderate oven till the slices are brittle and caramel coloured. The longer they are roasted the better the flavour. The slices should then grind easily in a coffee mill. If they don't it isn't brittle enough. Put it back in the oven.

Dandelion coffee makes a thick dark flavoursome drink, rather like Turkish coffee. Always use the freshly roasted root if possible for the best flavour. Dandelion coffee is made in the same way as ordinary coffee — place the grounds in a pan, pour over boiling water and steep for two minutes. Strain. An alternative can be made with milk — pour over a cup of milk for every dessertspoon full of ground dandelion, bring almost to the boil, and strain.

Dandelion coffee is reputed to be appetite stimulating, a digestive and anti-rheumatic, an excellent tonic and a very mild laxative.

Dandelion salad

Choose fresh young leaves or they will be bitter. I find that spring planted ones here go bitter in January. Tear them rather than cut them. They are a good base for something rich like hard boiled eggs with mayonnaise.

Steamed dandelion leaves

Slightly older leaves can be steamed, though again, if they are too old they will be bitter. Serve with a dressing of warm natural yoghurt.

Baked dandelion root

Dandelion roots can be scrubbed and placed in the tray with roast meat, like potatoes. They are excellent placed in a baking dish and dotted with butter. A little cider added at the end is an improvement.

Dandelion wine

Boil two litres of dandelion flowers for an hour in four litres of water with the rinds of two oranges and two lemons and 1.25 kg of sugar. Cool till tepid, add the juice of the oranges and lemons, 50 g of raisins and two tablespoons of fresh yeast or the equivalent dried.

Leave for 24 hours, strain and bottle without screwing down the tops. Do this only when fermentation has finished, which may be in a month or more.

Dandelion greens

Finely chop some bacon or onions and fry quickly in a little oil. As they start to crisp add chopped dandelion leaves and a little lemon juice. Fry till the leaves just start to wilt. Eat hot.

A heavy head of sunflowers, protected from the birds by netting, in the garden of Susie and Barry Thomas, next door to Jackie's property.

Soya beans

Soya beans can be grown from seed bought in supermarkets for consumption. They are very adaptable, and have similar requirements to green beans, tasting very similar when picked young.

Pick the beans when they are still tender and eat them like green beans. Use them fresh and podded as soon as the beans are big enough, even though the pods are still green, or leave the pods on the stalk till the whole plant is brittle if you want to store them.

Soya beans can be dried and ground into flour, or roasted in the oven like peanuts. I soak them in water and honey overnight, dry them, and fry them in oil with garlic till they are crisp and brown.

Soya bean milk

Soak some soya beans for at least 24 hours. Pour off the water, cover with boiling water and blend in a blender or moulie. Blend well for several minutes after it appears fine. Pour the liquid through a sieve, pressing well. Use at once, sweeten if you want to, (cow and goat's milk has a natural sugar, lactose) or boil for two minutes to 'pasteurise' it. Bottle, seal, and it should keep a week or two in the fridge.

Growing your own rice

Okay, rice is cheap to buy in bulk, and you can even buy organic rice if you look hard enough. But it's fun to grow, if only because its cultivation needs are different from most other crops. And fresh rice, like all fresh grains, tastes incredibly different from the commercial stuff, no matter how well grown.

There are two main types of rice grown commercially, *Oryza sativaindica and O sativa japonica. Indica* is a long, hard-grained rice, and best suited to tropical areas. *Japonica* is higher yielding, with short soft grains and adapts well to temperate areas. New cultivars have blurred the clear distinction between the two, but most rice grown in Australia is short grain, soft rice. Use fresh brown rice, unhulled if possible, for seed, or a stock and station agent will order some in for you. If in doubt try germinating some on wet cotton wool. If it hasn't done anything in three weeks on the window sill you've got a dud.

Rice is mostly used for human consumption. The hulls can be used for absorbent packing or pressed for edible rice oil.

To grow rice in the home garden 'trench' up an area so it will hold water, at least overnight. This is best done by digging a 20 cm deep pit, or by hilling up an area so the banks are about 15 cm high and lining the edges with a thick layer of old newspapers. Sow the rice one to three cm deep in late September to early October. Keep the area well watered, but not flooded, till the plants are well established, then flood them to about 5-15 cm deep.

Keep the area flooded with a trickling hose till the grain is nearly ready. It isn't disastrous if it dries out occasionally, especially overnight, but try to keep the water level up. An alternative method of growing is to germinate the seed on wet cotton wool, then broadcast it over an area that has already been lightly flooded.

Rice is sometimes grown for home quantities without flooding, though it must always be kept moist and completely weed free. Plant it very thickly to keep up the humidity and stop it falling over, mulch it deeply and always keep the mulch damp. Rice needs a reasonably high nitrogen level — apply it before the rice is planted — but low levels of phosphorous. As the rice ripens the panicle swells and becomes golden brown. Drain the rice at this stage, then wait three weeks or so till the grain is ready. Test it by breaking some open.

Once the rice is shaken off the stalks it must be hulled. This can be done at home by rubbing the grain through your fingers then turning a fan on it so the lighter hulls blow away, or rubbing it through a sieve. You now have brown rice, still with its high vitamin, oil rich germ, but with lower keeping qualities than white rice. White rice needs further polishing to remove the outer coats of the kernel, which is hard to do at home.

Millet

While we're on the subject of different crops for spring, think about millet. Millet is a beginner's crop. Millet grows by accident; it's the grain you see sprouting underneath the budgie's cage. Millet is a fast growing, annual summer grass to one metre with small seeds. It matures in 45 to 90 days — possible even in cold climates — and tolerates very poor soil, though yields are far greater on good land.

Millet can be ground to add to flour, made into a porridge or boiled for twice as long as rice and served in the same manner. Millet is a starvation food however — easily grown in poor conditions, but far less tasty than any of the alternatives.

It is mostly grown in Australia for canary seed (this is one way of getting millet seed to sow) but in some parts of Asia and Africa it is used for human food, and is usually made into breads, cakes or millet porridge.

Millet should be sown in early summer and well watered. It is not at all drought tolerant, and will be killed by the first frost. Make sure the seed bed is well prepared when you sow millet, because the seeds are very small. Sow them about two to three cm deep on fairly fertile soil, if possible, with adequate nitrogen and phosphorous.

What to do with millet

You can grind millet to flour in a flour mill (if you don't have a flour mill the blender can be used for small portions). Add it to wheat flour — about one cup to five wheat. Used like this it adds a nutty, richer flavour — very good for bread.

Try adding millet to rice dishes — again, one cup of millet to five of rice. Cook the millet about 20 minutes longer than the rice. The contrast in tastes and texture is good. Or feed it to the budgie.

Adzuki beans

These are also known as Japanese red beans. They are an annual, grown like green beans but will withstand higher temperatures and drought. They need a three to five month frost free period for maturity, so plant them now. They're worth it. If you've ever had bean-filled Chinese cakes you need your own sweet, fully ripened adzuki beans.

Grow adzuki beans like ordinary beans. I find hilling them when they are about a hand high increases the yield — they grow more roots and so are less susceptible to bean fly. You can eat them fresh, like string beans, or eat the podded seeds like peas. They are much sweeter eaten fresh than after they've been dried, when they have lost a lot of their sugar. For storage or dried beans they should be left on the bush till dry. Split them and take out the seeds, and dry them further for a couple of days before storing.

Adzuki beans can be cooked with rice, ground and used for bean paste or dried for later use in stews. Adzuki beans can also be used like green beans, picked immature. Buy the seed in specialty Asian shops. Most dried seed for cooking will germinate.

Red bean paste

This is just a bean purée. Cook the beans first. If needed (and you may not need it, because the beans should be sweet) add some honey or sugar syrup. Wrap pancakes around red bean paste; wrap filo pastry around it and fry in butter and eat hot or cold.

Chick peas

Chick peas will give you the same number of pods as green beans, if you want to eat them young. If you don't, leave them on the bush to dry and shell them to store. Plant chick peas from the supermarket after soaking them overnight. If they float they won't germinate — try and buy fresh packets.

Chick peas will grow wherever you grow peas, either in spring or autumn, but need four to seven months for the pea pods to dry out and the seeds to reach maturity. Make sure the area is kept clear of weeds: chickpeas can't stand much weed competition. Like beans, they grow better if the young plants are hilled up.

Chickpea bushes are about half a metre high, with small feathery branchlets (these are poisonous) and leathery pods. They are ready when they are light brown and brittle, but if they aren't, and you're near to frost time, pull up the whole plant and hang them from the verandah to dry under cover. Once you've shelled the peas leave them to dry on trays for a couple of days before storing. They should be too hard to bite. If there is any give or crunchiness they need more drying. Don't store any with blemishes because they won't keep and may infect the others.

We eat fresh chick peas by themselves with lemon and butter and a bit of cooked chopped onion — they are good like this hot or cold. Dried chickpeas can be added to soups or stews, or soak them, purée them, add an equal amount of tahini and lemon juice and garlic, salt and pepper to taste, and you've got hoummos. Hoummos is even better made with fresh chickpeas.

Stuff potatoes with hoummos and bake them in the oven. Place a layer of hoummos in a baking dish, add a layer of stir fried vegies. Add more hoummos and brown in the oven, and you have stuffed hoummos, which is great, especially drenched in a sauce of heated natural yoghurt with finely chopped garlic and coriander in it.

It always seems a waste when you have your own garden to limit yourself to vegies sold in seedling punnets in the nursery, the same tomatoes, silver beet and carrots year after year. You may never want to grow rice or millet or adzuki beans again — but it's fun to try them — and good to know you can.

Meters and multimeters for solar systems

•continued from page 7

Resistance measurements

A circuit or an appliance in your system that is connected so that current can flow has a resistance to current flow of from close to zero to a few thousand ohms. If current cannot flow in the circuit or appliance the circuit is said to be open and will have an infinite resistance. Thus the resistance scale on a multimeter is useful in telling you whether a circuit is complete or not.

It can also tell you about the terminals on a switch without the risk of blowing fuses to find out. A switch when closed has a resistance of zero and when open a resistance of infinity.

To test a switch, set the meter for resistance measurements, touch the two leads to a pair of switch terminals and toggle the switch. Observe the resistance for each switch position. Repeat for every other pair of switch terminals. Note that if the switch has two terminals, there is only one pair and testing is unnecessary, if it has three terminals, there are three pairs to test and if is has four terminals there are six pairs to test. The terminals to use in your light circuit are the two which show infinite resistance at one switch setting (off) and zero resistance at the other (on). Other switch terminals are generally irrelevant for low voltage direct current systems.

Resistance measurements should only be made to circuits and devices which are not directly connected to your system cells or batteries: connected circuits can overload and burn out your meter on the resistance range.

Care of your multimeter

Although a few meters are advertised as being able to be dropped and many as being overload protected, it is a good practice to treat all meters with care. Store them in their original cartons when not in use or make or buy a special case to protect them. Keep the leads tidy and don't pull on the probes because the wires are often thin and can become broken from where they join the probes. Before every reading double check you have the leads plugged into the correct jacks in the meter case and the meter switch turned to the appropriate scale. If you have any doubts, quickly touch the meter leads to the points in the circuit to be tested and note the result. If in this quick test the meter behaves normally you are safe to go ahead and touch the leads to the circuit for as long as it needs to take a reading.

Panel meters

You can also permanently wire in, at some power loss, panel voltmeters and ammeters to show you at a glance what is going on. The voltmeter you choose should show a full scale deflection just in excess of the maximum system voltage. For a 12 volt system, this will usually be 20 volts, and for a 24 volt system, 30 volts.

The ammeter should similarly have a full scale deflection just in excess of the maximum system current. If you are monitoring charging current you would need to allow about 3 amps per panel. The largest range on readily available panel meters only extend to 5 amps though some extend as far as 20 amps. If you can only buy a small range meter, you will need to be able to switch from panel to panel and to take extreme care with all readings to ensure you don't exceed the meter capacity.

As an alternative to a panel meter you can buy an automotive ammeter from a car spare parts shop. Such a meter will read to 30 amps or more but will not be accurate. It should be used only as a general guide to system activity and not as a definitive measurement. See also Peter Pedals' article in EG 55 on constructing a solar panel control board of your own.

In the next part of this series I will talk about those other solar system accessories, the consumable items like distilled water and petroleum jelly and aids to a neat and efficient system like terminal blocks and pin clips.

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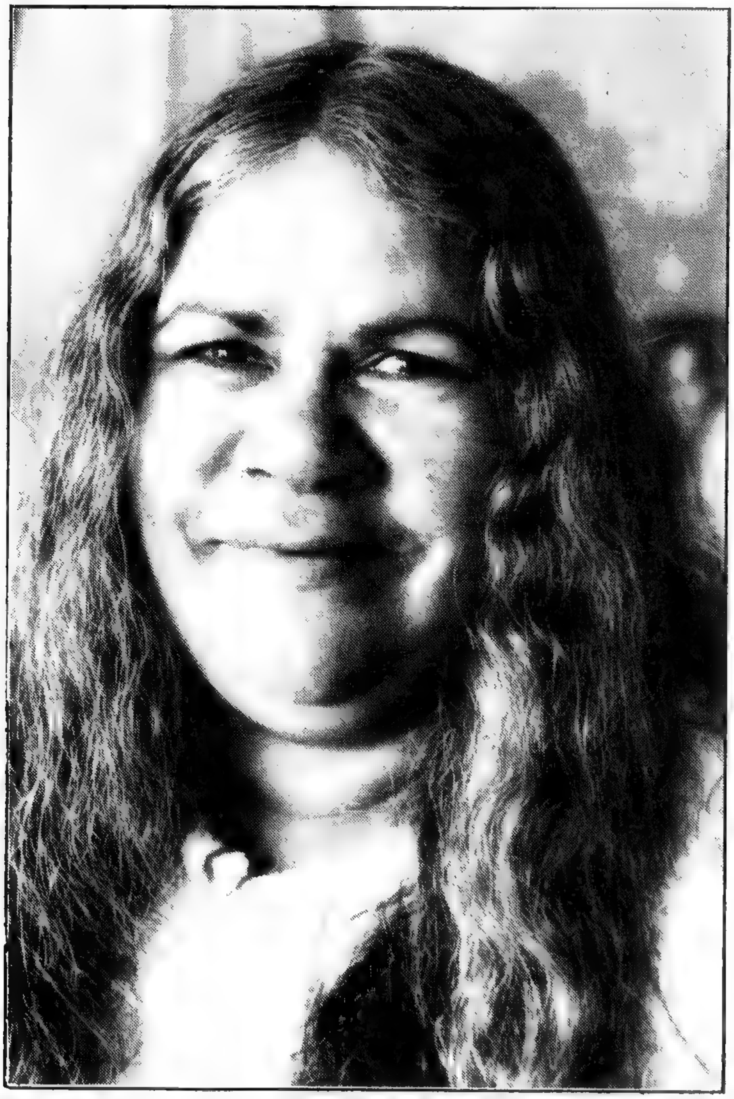


Co-Founder of the Indjibundji Tribal Aboriginal Cultural Dance School, Ponjydfljydu, whose name means "messenger".

Indjibundji Tribal Aboriginal Cultural Dance School

The Indjibundji Tribal Aboriginal Cultural Dance School is a private school and is the first of its kind in Victoria. The school began in July 1985 and aims to preserve and promote traditional Aboriginal culture through teaching dance, song, music and workshops both in the city and country areas.

Activities

Classes and workshops in the city or country can be arranged by contacting the school, and private or group classes are both possible. Gnarnayarrahe and Pojydfljydu are available for lectures, workshops, demonstrations and festivals etc.

Didjeridu

People interested in learning to play the didjeridu are welcome to contact the school. Ongoing classes, both private and group, are held at the school every week. Learning to play the didjeridu is a wonderful introduction to Aboriginal culture and all students of this, the oldest musical instrument in the world, have found classes rewarding.

For further information, contact
Gnarnayarrahe or Ponjydfljydu at
PO Box 334 Reservoir, Victoria, 3073.
Telephone (03) 469 3911.

Mulling it over

by Jose Robinson
Wild Cattle Island, Queensland.

WITH shorter days and long evenings still with us, what could be more therapeutic than sippin' on hot mulls, toddies or egg nogs? Sunk deep in our cosy chairs after a hard day's work, we may meditate on these long months of hibernation. What could be more pleasant than the aroma of cloves and cinnamon mingling with the mellow bouquet of hot red wine, making the senses twitch with delight and anticipation?

It's time to do something about it. Hunt up the most mind-bending recipes. Check the pantry and cellar for the ingredients and prepare for that coupe de grace.

The art of mulling wine is steeped in tradition. The romance and ritual of time-honoured mulls, brulogs and nogs dates back many centuries. Some memorable recipes have been handed down from great grandmama's day. Perhaps some of those old oldies may turn in their grave if they could see some of the modern-day versions of their formulas. For instance in Europe for quite some time now, they have been jiggling mini bags of gluehwein spices in mugs of heated red wine. Instant take-away mulls!

For those of us who enjoy sitting snugly by the fireplace spinning or weaving, knitting or leatherworking or whatever, rather than being glued to the idiotbox, here is the ultimate. A couple of steaming mugs of gluehwein to warm the cockles of the heart and help distance the traumas of the day, while mellowing the mood.

Bloody Mary soup

A dramatic reviver for starters is a hot mug of Bloody Mary soup. This is prepared from one cup of homemade tomato soup per serve, one tablespoon lemon juice, a teaspoon of Worcestershire sauce, a dash of tobasco and pepper and salt. Heat till simmering, add two jiggers of vodka and garnish with a dollop of sour cream and chopped chives fresh from the herb garden.

Bullshot

Another marvellous soother for starters is named the Bullshot. You take two thirds of a cup of fat-free beef bouillon, a jigger and a half of vodka, salt and freshly ground pepper, a teaspoon of lemon juice, a dash of Worcestershire sauce and warm, gently stirring. Pour it into a thick mug, sit back, sip and enjoy.

Egg-nog variation

Now for an interesting variation on the egg-nog. Even straight-laced Aunty Maud would approve of this one for an evening by the fire. It's been dubbed Tom and Gerry. This one is great for a Sunday evening when no one wants to cook. Take as many eggs as there are people. Beat the whites and yolks separately. Add one teaspoon of honey for each egg then mix the whites with the yolks. When it's time to serve, place two tablespoons of the mixture into each mug. Add one liqueur glass of brandy and one of red rum, and top it up with hot milk. Sprinkle freshly grated nutmeg on top, serve and await the compliments.

Mistletoe mull

For a cook with flair, serving a goodly measure of something mulled is unbeatable. Probably the most basic of brews is known as Mistletoe Mull. Take one bottle of burgundy, two lemons, one cup of granulated sugar, four cloves and two cups of water. Boil the water and sugar together for about five minutes adding cloves after the first minute. Now add the thinly sliced lemons and let it stand for about ten minutes. Next add burgundy and heat slowly. Be careful to it remove from the heat just before boiling point. Serve steaming hot in mugs.

The Bishop

A variation on the Mistletoe Mull is known as The Bishop. For this lively brew you will need two bottles of port, if you plan on having a couple of friends in to help you hibernate. Line up two lemons, four cloves, four lumps of sugar, mixed spices and two cups of water. Stick the four cloves into one of the lemons and place it in a moderate oven for 25 minutes. Next place the port into an enamelled pot and bring it almost to boiling point.

In a second pot, boil the two cups of water and add half a teaspoon of mixed spices and the lemon stuck with the cloves. Pour this liquid into the port, discarding the lemon. Rub the lump of sugar on the rind of the remaining lemon and drop it into a large jug. Now add half the juice of the discarded lemon and stir in the hot port. You can rely on mugs of this brew to create a lasting impression on your guests.

There is even a choice of a hot-pot for the ale enthusiast. This little gem is know as Beer-Pot-Punch. To execute it, place one pint of beer in a saucepan then add the same quantity of sherry. Slowly bring the brew to the boil. In a second saucepan heat two quarts of milk. Pour the heated milk into the beer and sherry mix. Add a teaspoon of sugar and some grated nutmeg. Pour into pottery mugs and sip by the fire.

Any one of these recipes should hit the spot every time. So for the remainder of the evening around the fire, well who knows? Happy hibernating!

EARTH GARDEN REVIEWS

Edited by Sophie Masson

The Owner Builder's Companion
by John, Gerry and Justin Archer,
Penguin Books, $24.99.

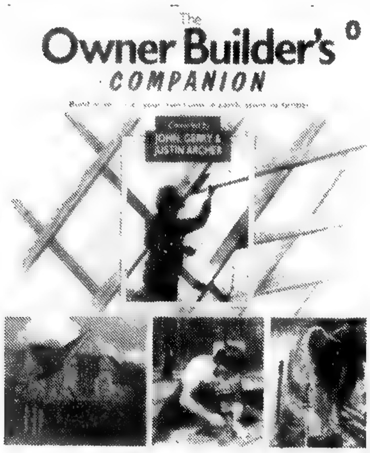
This is a great book, thoroughly recommended to all owner builders and renovators, as well as those dreaming of such things! It is packed full of all sorts of excellent, imaginative and realistic ideas that the Archers have become famous for through the magazine they used to publish, *Owner Builder.*

Basically, the book consists of the best of articles from this magazine over the years, and it covers a huge number of subjects, from plans and regulations to tools, building with timber, earth and stone, lights and floors right up to how to cope with bushfires and pests.

In this book, as the Archers point out, there is no mention of the 'ticky tacky school of building,' for "the orthodox approach to design and construction has produced a sterile conformity, an alienating environment . . . "

The houses and ideas in this book spring from the land itself, and this philosophy of low-cost, low-key building is surely one that we in Australia need to espouse. Make yourself or someone else happy and buy this book. It makes great reading, and, better still, is both practical and creative.

The Archers no longer run *Owner Builder*, Gerry Archer's untimely death in 1988 ended that chapter. John continues his active writing career with books and articles on architecture and building.



Guide to Arranging Dried Flowers
by Malcolm Hillier,
Simon and Schuster..

This is a beautiful, inspirational book for anyone interested in dried flowers. The ideas discussed in this book are absolutely marvellous, and the products which should result will be the cynosure of all eyes!

Malcolm Hillier says that 'to work with flowers is one of the most fortunate experiences possible', and his enthusiasm for the beautiful glowing still lifes created by arranging dried flowers is infectious. In this book he invites you to share his passion, and to create beautiful pieces yourselves.

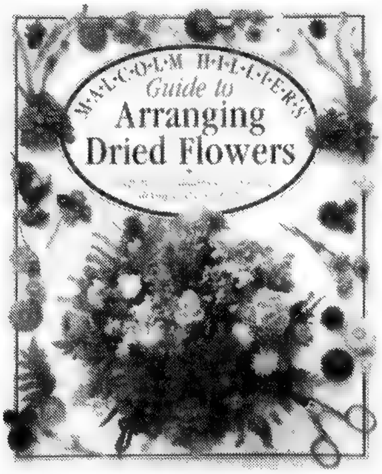
There is exhaustive detail on the principles of arranging, how to decorate around an arrangement, arrangements for special occasions, drying and preserving techniques and colour-coded arrangements from your garden.

There is also an excellent plant guide and guide to tools, materials and containers.

The book is well illustrated and set out, and features many lovely colour photos of the arrangements discussed.

Outback Cooking in the Camp Oven
by Jack and Reg Absalom,
Five Mile Press,
$16.95.

A cookery book with a difference. This one's based on the bush and camp cooking of earlier days. In it the Absaloms, both seasoned bush cooks, present a selection of marvellous recipes based around that once-common item, the camp oven. The ingredients are mostly bush tucker — rabbit, kangaroo, fish and yabbies. But there are also plenty of other low-cost, easy to carry ingredients, such as rice, pasta, mince and eggs.



There are sections on soups, starters, main courses, sauces, vegetable dishes, and lots of 'rib-sticking' yummy hot puddings! There's also a section on damper, scones and bread.

The book is illustrated with lots of colour photos of the resulting 'al fresco' meals, taken at bush camps. Many of these recipes could also quite easily be adapted for more conventional cooking methods and utensils. They certainly made my mouth water, just looking at them!

by Antoinette Shanahan
Goongerah, Victoria.

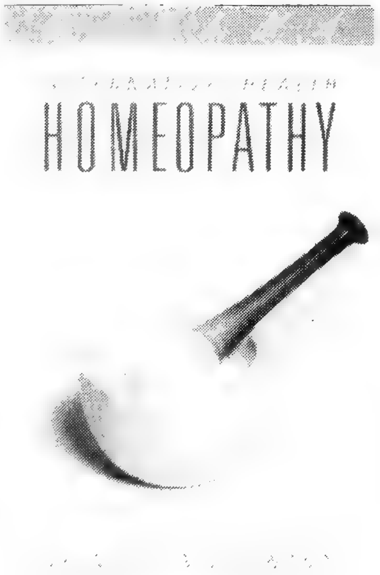
Preserving, by Ann Creber A Fowlers Vacola Guide to Preserving by Regency Publications. Prahran Victoria, 1988.

This is the latest Fowler's Vacola bottling book. It is well laid out and easy to read with lots of glossy pictures of meals produced using preserves. It begins with a brief history of bottling, followed by the basic principles and steps involved. The format is clear and systematic making it very suitable for beginners as well as old hands.

Two to three pages are dedicated to each fruit (and the odd vegetable). The preserving technique is described followed by a number of recipes for dishes that can be made using the preserves. Some are old time favourites while others are the contemporary sort you may find in a yuppie café or oriental restaurant.

There is an eight page section on pickling and a smaller section on jams and festive baking such as plum puddings and mince pies. It does not have a lot of the detail, odd quotes and tips, that feature in previous books but because of this it is an easy and straightforward guide to bottling.

Also, unlike previous Fowler books, it does not give details on the bottling of meats, fish or poultry and recommends that readers freeze such foods rather than bottling them.



Homoeopathy by Dr Nelson Brunton, Alternative Health series (Optima paperbacks), Hodder and Stoughton, $14.95.

Homoeopathy is very different from the orthodox 'allopathy' which is now practised by most doctors. It does not look at a collection of symptoms and try to solve them, rather, it looks at the whole person, including mental and spiritual aspects, and tries to work out the right method of approaching that person's 'lack of ease' and the problems it produces.

It was 'invented' by a German doctor, Christian Hahnemann, in the 18th Century, although its elements are thousands of years old. There are three cardinal points to remember in homoeopathic treatment — that it treats like with like (rather like vaccination!); that doses are given so dilute that only the 'dynamic energy' of the substance remains, and that doses are always shaken up. Lately, homoeopathy received some vindication in the wider scientific world through the publication of experiments by French scientists in the prestigious journal *Nature*. (Although *Nature's* editors were so shaken by these reports that they took the extraordinary step of publishing the article with a warning!)

In this book Dr Brunton, a practising homoeopath, provides good, clear information for all those interested in homoeopathy. This is an excellent book, well worth buying and keeping on your medical reference shelf.

Massage by Ken Eyerman, Sidgwick and Jackson, through Macmillan, $24.99.

This is a very well presented book, lavishly illustrated with beautiful black and white photographs.

Ken Eyerman's approach to massage is clear and effective, and he uses a combination of Eastern and Western techniques, emphasising the need for both spiritual and physical balance. He has worked extensively with actors and dancers, and has evolved his massage system over many years.

The book is divided into seven lessons, including one on fundamental energy. (The others are all focused on parts of the body, such as back, pelvis, head, etc). In each lesson Ken Eyerman takes us through a series of exercises and reflections, so that optimum relaxation and balance of mind, body and spirit is achieved.

This book is not only excellent for massage practitioners, but also for any amateur interested in massage, and prepared to 'have a go' at it with family and friends.

EARTH GARDEN UNCLASSIFIEDS

Unclassifieds are 30 cents per word, prepaid. No Unclassifieds will be printed in the October issue. The deadline for the December issue is 15 November.

KINGS SEEDS - 60 New Varieties. The new range of 460 seed varieties includes Herbs, Dried Flower seeds, Bee Plant seeds, Insect Repellents, Oriental and Gourmet Vegetable seeds. Send $5.80 for our new glossy 1989-91 colour catalogue. Helpful hints on how to grow and use the plants are included, or send SASE for a price list. Two wall charts - $4.00 each - Culinary or Remedial herbs and how to use them, plus P&H $2.00 per order. Trade enquiries welcome. Kings Herb Seeds, PO Box 14, Glenbrook, NSW, 2773. Australian Distributor for Kings Herbs Ltd, New Zealand.

LOOKING FOR MORE MEANING IN YOUR LIFE? Women are invited to stay at our rural property one week or longer during September 11-30. Opportunity for exploring meditation, communication, crafts, plus rest, refreshment. Food and accommodation free. Write to Sister Helen, Sisters of the Church, Anglican, Dondingalong via Kempsey, NSW, 2440, or telephone (065) 669 244.

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COMPANION PLANTING CHART. Over 90 vegetables, herbs, and fruits, including plants as insect repellents. Mail order $4.50 (postage included). SOW WHEN CHART. Suggested sowing times for 100 vegetables, herbs and flowers. Mail order $5.00 (postage included). 'Plum Products' (E) RMB, 2907, Bruthen, Vic, 3885.

BUILDING BIOLOGY - Professor Schneider's German correspondence course recently translated. Study with the International Institute of Baubiologie and Ecology, USA. Details - IBE, C/- Post Office Box 159, Nimbin, NSW, 2480.

DOWSING FOR HARMONY. Alanna Moore's exciting new correspondence course. Details - Post Office Box 159, Nimbin, NSW, 2480.

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FRIENDS OF THE EARTH BOOKSHOP. For books, resources and information about recycled paper, self-sufficiency, peace issues and much more drop in, or write to FOE Bookshop, 222 Brunswick St, Fitzroy, 3067; phone (03) 419 8700.

LAND LINES

LAND LINES are for people buying, selling, seeking or sharing houses and land. It is your responsibility to check all deals. We charge a rate of 30 cents per word (prepaid) for a listing of any desired length, plus $20 for a professionally-drawn illustration to go with your ad, taken from any old tatty photo you care to send us. All LAND LINES must include your name and address (phone number is optional). No LAND LINES will be printed in the October isse. LAND LINES for the December issue should arrive (at PO Box 188 Moreland, 3058) by 15 November.

NSW NORTH COAST, in hills behind Woolgoolga, 410 acre property, for wildlife lovers. Official Wildlife Refuge. 3 creeks, swimming holes, rainforest, Bangalow palms, tall eucalypt forests, heaths, ridges, swamps, very rich in wildlife (rare species). Better climate than Lismore region. Plus log house with verandahs all round, phone, combustion stove, solar power, generator, pump, garden, family orchard with many exotic fruits, 12 minutes to shop, petrol, highway, school bus, 30 minutes to Grafton, 35 minutes to clean beaches. $150,000 ono (066) 494 531.

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NATURAL PEST CONTROLS — Pyrethrum — effective against range of pests. Quassia chips — kills small caterpillars, aphids; repels pollsums, wallabies. Packet makes 5 litres spray — $4 each includes postage. Natural Choice Herbs, Lot 3 Emerson Rd, Rosebank, NSW 2480.

THE GOURDIAN 1st 2nd editions are out now, for all your gourd information which includes growing, history, tips on carving, burning etc. Magazine cost $3.50 per edition which includes p & h. Free Book and Seed catalogue with each order. Send to John Van Tol, 187 George St, East Maitland, NSW 2323.

HANNAM VALE, NEW SOUTH WALES. 9 acres for sale in beautiful mid north coast valley. Close to forest drives and national park in foothills of Comboyne plateau. Several homesites with different views. Permanent creek and dam. Power, telephone and easy road access. Village, primary school, bus to Taree or 30 minutes to coast and one hour to Port Macquarie. $40,000, some owner finance if needed. Telephone Bill Donovan (02) 713 6640 or write to 20A Reginald Street, Abbotsford, NSW, 2046.

COONABARABRAN, NEW SOUTH WALES. Older style country home on large block 12 minutes from Coonabarabran, New South Wales. Land available for stock, telephone (068) 427 881 for details. $50,000.

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Skilled couple with son, 6, and infant daughter seek home site or established home on central or northern NSW community. Keen gardeners, friendly outlook. Neville Penton, Springfield Station, Goulburn 2580. Telephone (048) 295 163.

WANTED — Share in community mid to north coast NSW or SE Qld. Couple and children, one family dog of 2 years (essential component) — would like cottage already set up. Water source important. Please contact Theresa, 66 Shire St, Coorparoo, Brie or Ron, Sydney (02) 525 9487. Thanks.

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written and illustrated by Marja Fitzgerald

Australia's first house cow book written from an organic, wholistic perspective. Everything from fencing to cheesemaking and organic health solutions. 'The Healthy House Cow', published by Earth Garden, is now available. 144 pages, large format paperback, and full of useful information for prospective or current house cow owners. $18.00 posted -

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EG50: Land ethics . . . Sustainable agriculture . . . Biodynamic, Keyline, Organic, Permaculture methods . . . healthy sweets . . . bamboo ladder . . . happy gardening . . . homegrown spuds . . . stone & mudbrick arches . . . Earthbricks . . . ferrocement tank . . . poultry pyramids . . . Energy Pulse.

EG51: Australian solar kit homes . . . self-sufficient house . . . solarium . . . energy updates . . . thin film solar panels . . . ram & sun pumps . . . two-faced stonework . . . river stone & mudbrick . . . earth building access . . . kero refrigeration . . . a shunt regulator . . . vegie basics . . . corn is king . . . 3-ply spinning . . . loo review .

EG52: Simple solar electric systems . . . 1 2 V fridge . . . 12V record player . . . EG interviews . . . composting with earth-worms, glazing skills, mudbrick pictures.

EG 53: Horse drawn gypsy holidays . . . solar refrigeration . . . cottage gardens . . . organic scale control . . . do-it-yourself land transfer . . . bartering . . . chaff cutters . . . controlling scale . . . natural cow care . . . solar fridge design . . . earth bricks made easy . . . the Land Rover.

EG54: 12V solar lighting and appliances . . . tomatoes . . . chick brooder . . . inverters for 240V appliances for solar systems . . . boring for water . . . festivals.

EG 55: Mudbricks from heavy clay . . . managing plant diseases . . . building a baby's cradle . . . a biodynamic farm . . . making cider . . . a hot drum warning . . . a solar control board . . . thoughts on solar retailing . . . thyme . . . owner builder apprenticeship.

EG 56: Energy-efficient house design . . . Battling in the bush . . . costing an owner-built home . . . controlling fruit fly organically . . . build a home food smoker . . . windpower . . . towards food self-sufficiency . . . simple devices for lower voltage . . . solar tracking . . . toxic mushrooms . . . leeks . . . motorised scythes.

EG 57: Building with children . . . solar trackers . . . eel skin mocassins . . . towards food self-sufficiency . . . calculating sun angles . . . how to rout busybodies . . . the elder tree . . . lemon grass . . . rammed earth corners . . ockerinas: a potter's livelihood.

EG 58: Making a living from pottery . . . Battling in the Bush, Part III . . . Rainbow Power Company . . . Towards food self-sufficiency . . . Organic gardening column . . . Hoof care for donkeys . . . Saving world rainforests . . . Cob earth building . . . Solar car race results . . . Creative beermaking . . . Build a geodesic dome plantarium.

EG 59: Buying a bush block . . . Living in yurts . . . Borage — herb of gladness . . . Biodynamic farming . . . Growing cabbages . . . Raspberries . . . Earthworm cultivation . . . Using a bait castnet . . . Torches in the bush.

EG 60: Owner-building octagons . . . Growing mushrooms . . . Alternative pasture . . . Growing rosemary . . . Bush tucker . . . Low speed generator . . . Sailing to the far north.

EG 61: Making futons . . . Building a mudbrick hothouse . . . Using wood heaters . . . A herbal tea farm . . . Growing grain . . . 12 volt amp and turntable . . . Cattle diseases . . . Lemon balm . . . donkey training . . . Resharpening a bushman's saw.

EG 62: Breeding angora goats . . . Donkey training . . . Make a pioneer work shirt . . . Pickles and chutneys . . . Frost-free gardens . . . Growing sprouts . . . Trees for shelter and woodlotting . . . growing fennel . . . Cost comparison of home heating . . . Building an African village.

EG 63: Special 'Bicentenary' issue — Aboriginal Australia and self reliance . . . Traditional shelter and agriculture . . . Rangers at Kakadu . . . Gary Foley interview . . . Mudbrick desert community centre . . . 19th Century Aboriginal farmers . . . low voltage washing machines . . . Roofing tips . . . Battery warning . . . Fostering calves

EG 64: Organic farms in Spain . . . Buying at clearing sales . . . Making and laying a shingle roof . . . Basic home electrics . . . Dealing with building inspectors . . . The Seed Savers' Network . . . Backyard astronomy . . . Mudbrick plastic coats . . . Herbs: watercress . . . wholesome education.

EG 65: Puppet making . . . Making pasta . . . Televison-free zone . . . Make a battery-operated blender . . . Food irradiation update . . . Cherryplum glut recipes . . . Earth sculpture . . . 12 volt wiring basics . . . Fallen timber into firewood . . . Angelica.

EG 66: The Demountable Throne . . . The Healthy House Cow . . . Confest '89 . . . EARTH GARDEN INDEX, EG 51-65 . . . Egg gluts . . . bees . . . Solar powered workshop . . . Insect bites . . . Home power batteries.

In our last issue

EG 67: Getting rid of termites . . . Gourd Festival . . . Battery terms . . . Spanish organics . . . Colonial Blacksmith . . . Small business ideas . . . Saving rainforests.

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